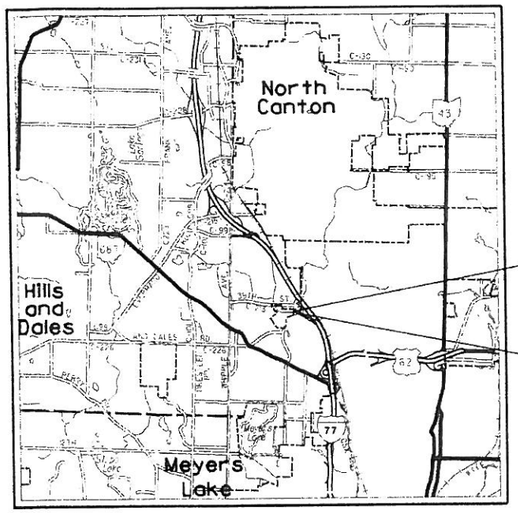
GUILFORD AVENUE NW
BRIDGE REPLACEMENT

CITY OF CANTON

STARK COUNTY



LOCATION MAP

LATITUDE: N40°50'22" LONGITUDE: W81°24'22"

SCALE IN MILES
0 1 2 3 4

PORTION TO BE IMPROVED
INTERSTATE & DIVIDED HIGHWAY
UNDIVIDED STATE & FEDERAL ROUTES
OTHER ROADS

DESIGN DESIGNATION

CURRENT ADT (2005)	5900
DESIGN YEAR ADT (2025)	5900
DESIGN HOURLY VOLUME (2025)	590
DIRECTIONAL DISTRIBUTION	60%
TRUCKS (24 HOUR B&C)	3%
DESIGN SPEED	30 MPH
LEGAL SPEED	25 MPH

DESIGN FUNCTIONAL CLASSIFICATION: LOCAL ROAD

DESIGN EXCEPTIONS

NONE REQUIRED

INDEX OF SHEETS:

PROJECT DESCRIPTION

IMPROVEMENT OF 0.02 MILES OF GUILFORD AVE BY REPLACEMENT OF EXISTING STRUCTURE OVER THE WEST BRANCH OF NIMISHILLEN CREEK INCLUDING APPROACH RECONSTRUCTION.

2008 SPECIFICATIONS

THE STANDARD SPECIFICATIONS OF THE STATE OF OHIO, DEPARTMENT OF TRANSPORTATION, INCLUDING CHANGES AND SUPPLEMENTAL SPECIFICATIONS LISTED IN THE PROPOSAL SHALL GOVERN THIS IMPROVEMENT.

I HEREBY APPROVE THESE PLANS AND DECLARE THAT THE MAKING OF THIS IMPROVEMENT WILL REQUIRE THE CLOSING TO TRAFFIC OF THE HIGHWAY AND THAT DETOUR ROUTES WILL BE PROVIDED AS INDICATED ON SHEET 19.

APPROVED Dan Magliano

DATE 6/25/10 CITY OF CANTON, ENGINEER

UNDERGROUND UTILITIES
TWO WORKING DAYS
BEFORE YOU DIG
CALL 1-800-362-2764 (TOLL FREE)
OHIO UTILITIES PROTECTION SERVICE
NON-MEMBERS
MUST BE CALLED DIRECTLY

PLAN PREPARED BY:

NORTHWEST CONSULTANTS, INC.
3220 CENTRAL PARK WEST
TOLEDO, OH 43617
(419) 841-4704

ENGINEERS SEAL:

FOR ENTIRE PLAN INCLUDING STRUCTURE OVER 20'

STATE OF OHIO — REGISTERED PROFESSIONAL ENGINEER

SIGNED: [signature] PROJECT MANAGER
DATE: 10/11/2004

STANDARD CONSTRUCTION DRAWINGS

BP-5.1	7-20-07	BR-2-98	07-16-02
CR-1.1	07-16-02		
CR-2.1	01-16-04		
CR-3.1	10-16-09		
CR-4.1	01-18-08		
CR-4.2	01-18-07		
CB 1.1	07-15-05		
DM-1.1	01-21-05		
DM-4.3	01-17-09		
DM-4.4	01-17-09		

SUPPLEMENTAL SPECIFICATIONS

802	07-19-02
832	01-17-01
833	02-12-03

SPECIAL PROVISIONS

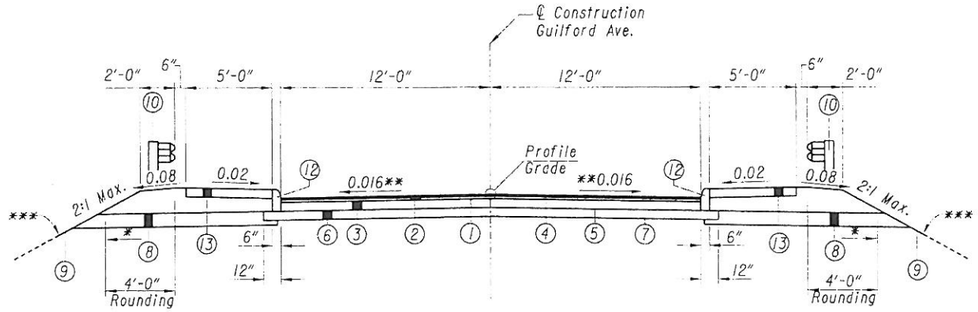
FEDERAL PROJECT NO.

PID NO.

CONSTRUCTION PROJECT NO.

RAILROAD INVOLVEMENT
NONE

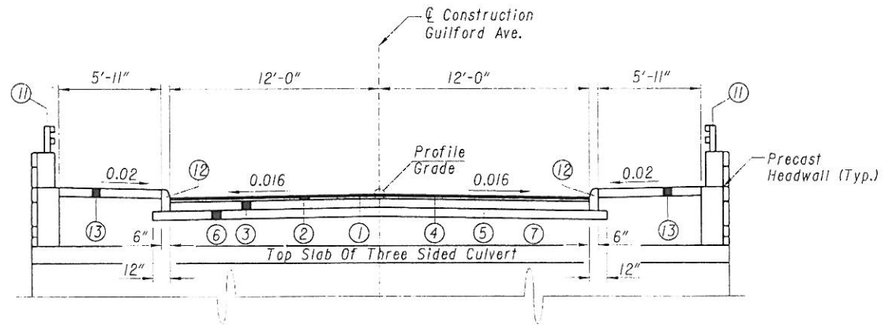
GUILFORD AVE. NW
BRIDGE REPLACEMENT



* 0.04 Minimum
0.08 Preferred
** Match Slope At Begin And End Of Pavement Work
*** Match Existing

NORMAL SECTION

Sta. 14+45.00 To Sta. 14+87.25 = 42.25 Ft
Sta. 15+25.59 To Sta. 15+70.00 = 44.41 Ft
Total Length = 86.66 Ft



CULVERT SECTION

Sta. 14+87.25 To Sta. 15+25.59 = 38.34 Ft
Total Length = 38.34 Ft

LEGEND

(1) ITEM 448 - 1¼" Asphalt Concrete Surface Course, Type I, PG64-22
(2) ITEM 448 - 1¾" Asphalt Concrete Intermediate Course, Type 2, PG64-22
(3) ITEM 301 - 7" Asphalt Concrete Base, PG64-22
(4) ITEM 407 - Tack Coat For Intermediate Course
(5) ITEM 408 - Prime Coat (0.40 Gal./Sq.Yd.)
(6) ITEM 304 - 6" Aggregate Base
(7) ITEM 204 - Subgrade Compaction
(8) ITEM 605 - Aggregate Drains
(9) ITEM 659 - Seeding and Mulching
(10) ITEM 606 - Guardrail, Type 5
(11) ITEM 517 - Railing (Concrete Parapet With Twin Steel Tube Railing)
(12) ITEM 609 - Curb, Type 6
(13) ITEM 608 - 4" Concrete Walk

TYPICAL SECTIONS

GUILFORD AVE. NW
BRIDGE REPLACEMENT

ROUNDING:

THE ROUNDING AT SLOPE BREAKPOINTS SHOWN ON THE TYPICAL SECTIONS APPLY TO ALL CROSS-SECTIONS EVEN THOUGH OTHERWISE SHOWN.

UTILITIES:

LISTED BELOW ARE THE UTILITES LOCATED WITHIN THE PROJECT CONTRUCTION LIMITS TOGETHER WITH THEIR RESPECTIVE OWNERS:

TELEPHONE: AMERITECH
50 W. BOWERY ST.
FLOOR 4
AKRON, OH 44308
(330)-384-3449

GAS: DOMINION EAST OHIO
4725 SOUTHWAY ST. S.W.
CANTON, OH 44706
(330)-478-3140

ELECTRIC: AEP
301 CLEVELAND AVE. SW-P.O. BOX 24400
CANTON, OH 4470i
1-800-672-2231

AEP
825 TECH CENTER DR.
GAHANNA, OH 43230-6605
(614) 552-1180

SANITARY: STARK COUNTY SANITARY
ENGINEERS DEPARTMENT
1701 MAHONING RD. N.E.-P.O. BOX 7906
CANTON, OH 44705-7906
(330)-453-9044

WATER: CANTON WATER DEPARTMENT
ENGINEERING OFFICE
2664 HARRISBURG RD. N.E.-P.O. BOX 7904
CANTON, OH 44705-7904
(330)-489-3310

CABLE: TIME WARNER CABLE
5520 WHIPPLE AVE.
NORTH CANTON, OH 44720
(330)-494-9200 EXT. 3087

CONTINGENCY QUANTITIES:

THE CONTRACTOR SHALL NOT ORDER MATERIALS OR PERFORM WORK FOR ITEMS DESIGNATED BY PLAN NOTE TO BE USED "AS DIRECTED BY THE ENGINEER" UNLESS AUTHORIZED BY THE ENGINEER. THE ACTUAL WORK LOCATIONS AND QUANTITIES USED FOR SUCH ITEMS SHALL BE INCORPORATED INTO THE FINAL CHANGE ORDER GOVERNING COMPLETION OF THIS PROJECT.

ELEVATION DATUM:

ALL ELEVATIONS ARE BASED ON U.S.G.S. DATUM, NAVD88.

WORK LIMITS:

THE WORK LIMITS SHOWN ON THESE PLANS ARE FOR PHYSICAL CONSTRUCTION ONLY. THE INSTALLATION AND OPERATION OF ALL TEMPORARY TRAFFIC CONTROL AND TEMPORARY TRAFFIC CONTROL DEVICES REQUIRED BY THESE PLANS SHALL BE PROVIDED BY THE CONTRACTOR WHETHER INSIDE OR OUTSIDE THESE WORK LIMITS.

STREAM CHANNEL EXCAVATION:

THE CONTRACTOR SHALL TAKE ALL PRECAUTIONS NECESSARY TO PREVENT ANY INCIDENTAL DISCHARGES ASSOCIATED WITH THE EXCAVATION AND HAULING OF MATERIAL FROM THE STREAM CHANNEL. THIS PERTAINS TO ANY EXCAVATION OPERATIONS SUCH AS, FOUNDATION PIER OR ABUTMENT EXCAVATION, CHANNEL CLEANOUT, EXCAVATION FOR ROCK CHANNEL PROTECTION AND REMOVAL OF ANY TEMPORARY FILL ASSOCIATED WITH CONSTRUCTION OPERATIONS.

INSTREAM WORK:

INSTREAM WORK WILL BE LIMITED WHERE PRACTICABLE AND ONLY CLEAN NON-ERODIBLE MATERIAL WILL BE USED FOR FORDS OR COFFERDAMS. THIS TEMPORARY PLACED MATERIAL WILL BE REMOVED AND THE STREAM BOTTOM RESTORED TO NEAR NATURAL CONDITIONS WHEN THE WORK IS COMPLETED.

CLEARING AND GRUBBING:

ALL TREES AND STUMPS SPECIFICALLY MARKED FOR REMOVAL WITHIN THE CONSTRUCTION LIMITS SHALL BE REMOVED UNDER THE LUMP SUM BID FOR ITEM 201 CLEARING AND GRUBBING. THE FOLLOWING IS AN APPROXIMATE ESTIMATE OF THE NUMBER OF TREES AND STUMPS TO BE REMOVED.

SIZES	NO. TREES	NO. STUMPS	TOTAL
12"	2		2

SEEDING AND MULCHING:

THE FOLLOWING QUANTITIES ARE PROVIDED TO PROMOTE GROWTH AND CARE OF PERMANENT SEEDED AREAS:

659, TOPSOIL 36 CU YD

659, SEEDING AND MULCHING 321 SQ YD

659, REPAIR SEEDING AND MULCHING 16 SQ YD

659, INTER-SEEDING 16 SQ YD

659, COMMERCIAL FERTILIZER 0.05 TON

659, AGRICULTURAL LIME 0.05 TON

659, WATER 1.78 M GAL

SEEDING AND MULCHING SHALL BE APPLIED TO ALL AREAS OF EXPOSED SOIL BETWEEN THE RIGHT-OF-WAY LINES AND WITHIN THE CONSTRUCTION LIMITS FOR AREAS OUTSIDE THE RIGHT-OF-WAY LINES COVERED BY WORK AGREEMENT OR SLOPE EASEMENT. QUANTITY CALCULATIONS FOR SEEDING AND MULCHING ARE BASED ON THESE LIMITS.

EROSION CONTROL:

ITEM 601 IS PROVIDED IN THE PLANS FOR EROSION CONTROL ROCK OF A STABLE NATURE SHALL NOT BE REMOVED IN ORDER TO PLACE ANY OF THESE ITEMS. THE ENGINEER SHALL CHECK AND NON-PERFORM QUANTITIES OR ADJUST LOCATIONS AND QUANTITIES OF THESE ITEMS WHERE INDICATED BY FIELD CONDITIONS DURING CONSTRUCTION.

FARM DRAINS:

ALL FARM DRAINS, WHICH ARE ENCOUNTERED DURING CONSTRUCTION, SHALL BE PROVIDED WITH UNOBSTRUCTED OUTLETS. EXISTING COLLECTORS WHICH ARE LOCATED BELOW THE ROADWAY DITCH ELEVATIONS, AND WHICH CROSS THE ROADWAY, SHALL BE REPLACED WITHIN THE CONSTRUCTION LIMITS BY ITEM 603 CONDUIT, TYPE B, ONE COMMERCIAL SIZE LARGER THAN THE EXISTING CONDUIT.

EXISTING COLLECTORS AND ISOLATED FARM DRAINS, WHICH ARE ENCOUNTERED ABOVE THE ELEVATION OF ROADWAY DITCHES, SHALL BE OUTLETTED INTO THE ROADWAY DITCH BY 603 TYPE F CONDUIT. THE OPTIMUM OUTLET ELEVATION SHALL BE 1 FOOT ABOVE THE FLOWLINE ELEVATION OF THE DITCH. LATERAL FIELD TILES WHICH CROSS THE ROADWAY SHALL BE INTERCEPTED BY 603 TYPE E CONDUIT, AND CARRIED IN A LONGITUDINAL DIRECTION TO AN ADEQUATE OUTLET OR ROADWAY CROSSING.

THE LOCATION, TYPE, SIZE AND GRADE OF REPLACEMENTS SHALL BE DETERMINED BY THE ENGINEER AND PAYMENT SHALL BE MADE ON FINAL MEASUREMENTS.

EROSION CONTROL PADS AND ANIMAL GUARDS SHALL BE PROVIDED AT THE OUTLET END OF ALL FARM DRAINS AS PER STANDARD CONSTRUCTION DRAWING DW-1.1, EXCEPT WHEN THEY OUTLET INTO A DRAINAGE STRUCTURE. PAYMENT FOR THE EROSION CONTROL PADS AND ANIMAL GUARDS AND ANY NECESSARY BENDS OR BRANCHES SHALL BE INCLUDED FOR PAYMENT IN THE PERTINENT CONDUIT ITEMS.

THE FOLLOWING ESTIMATED QUANTITIES HAVE BEEN INCLUDED IN THE GENERAL SUMMARY FOR THE WORK NOTED ABOVE:

603, 6" CONDUIT, TYPE B 25 FT

603, 6" CONDUIT, TYPE E 25 FT

603, 8" CONDUIT, TYPE F 25 FT

DUST CONTROL:

THE CONTRACTOR SHALL FURNISH AND APPLY WATER FOR DUST CONTROL AS DIRECTED BY THE ENGINEER. THE FOLLOWING CONTINGENCY QUANTITIES HAVE BEEN INCLUDED FOR DUST CONTROL PURPOSES:

616, WATER 0.15 M. GAL.

TEMPORARY SOIL EROSION AND SEDIMENT CONTROL:

THE FOLLOWING ESTIMATED QUANTITIES ARE TO BE PLACED BY THE CONTRACTOR WITH THE ENGINEER'S CONCURRENCE FOR TEMPORARY EROSION AND SEDIMENT CONTROL MEASURES:

207, PERIMETER FILTER FABRIC FENCE 250 FT

SJF
JBO

GENERAL NOTES

GUILFORD AVE. NW
BRIDGE REPLACEMENT

3
38

GENERAL NOTES:

WATER MAINS/SERVICES:

All Water Mains, Services and Appurtenances Shall Be Designed and Constructed According to the City of Canton Water Department Requirements and Specifications in Effect at the Time of Construction.

For new water mains inside the city, all water main pipe materials, fittings, bends, valves, valve boxes, megalugs, gaskets and hydrants will be supplied by the City of Canton. The contractor will be responsible for transporting materials to the project site. Backfill, bedding, thrust blocking, etc. and associated labor is the responsibility of the contractor.

Water Mains Shall Be Class 53 (12" and Under) or Class 54 (Over 12") Ductile Iron, Meeting AWWA C151 with Push Joints. The Minimum Cover over Water Mains Shall Be 4'-6" from Ground Surface to the Barrel of the Pipe. The Outside Surface of All Ductile Iron Pipe, Fittings and Appurtenances Shall Be Shop Coted with Either a Coal Tar or Asphalt Base Bituminous Material. If the Coating Material Is Found to Be Damaged Prior to the Pipe Trench Being Backfilled, the Contractor Shall Provide an Additional Approved Material as Required to Repair the Damages. The Contractor Shall Have Sufficient Coating Materials Available at the Job Site Prior to Laying the Pipe. The Interior of All Pipes and Fittings Shall Be Lined with Double Cement Mortar and Seal Coated in Complete Conformance with AWWA C104, or the Latest Revision. Fittings Shall Be Rated for 250 Psi Working Pressure in Accordance with AWWA C153. Pipe Lengths May Be Deflected at the Joint If Required, at One-half the Degree Recommended by the Manufacturer.

Plastic pipe shall be AWWA C909 PVCO Pressure Pipe, CL200.

Water Services Will Be Installed by the Canton Water Department and Paid for by the Owner/developer.

Any commercial or industrial water service must have site and plumbing plans submitted to the Canton Building Department for approval. The Canton Building Department will distribute the plans to the appropriate Departments for review and comments. Corrections must be made and resubmitted. Price estimates will not be issued and service taps will not be made until the plans have been approved by the Canton Water Department.

Disinfection of Water Mains Shall Be in Accordance With AWWA C651.
All Water Line Pressure Testing Shall Conform to AWWA C600.
Water Mains Shall Be Installed and Backfilled per O.D.O.T. Item 638.
Water Lines Located Within the Limits of or Within a « to 1 Slope of Existing And/or Proposed Roadways, Parking Areas, Buildings, Sidewalks, And/or Drives Shall Be Installed as Type B Conduits. All Other Water Mains Shall Be Installed as Type C Conduits. Bedding Shall Be as Specified, Except the Slag Will Not Be Permitted.

All Bends, Fittings, Tees, Valves, Dead Ends, Etc. Shall Be Secured Equal. Poured-in-place Concrete Thrust Blocks Shall Also Be Provided At/for Each Bens, Fitting, Tee, Dead End, Etc. this Blocking Shall Be Carefully Placed to Ensure it Is Positioned Properly to Withstand the Resultant Forces at Each Bend, Fitting, Etc. and Shall Bear on Stable Undisturbed Ground Capable of Withstanding the Potential Loading. Tie Rods Are to Be 3/4 Inch Diameter. Two Tie Rods Are Required for an 8 Inch Pipe, and Four Tie Rods Are Required for 12 Inch Pipe.

In Addition to the Restraint of All Bends, Fittings, Tees, Valves, Dead Ends, Etc. the Contractor Shall Also Secure/restrain All Joints for at Least Three (3) Pipe Joints (50 Lf Min.) Beyond Each Dead End, Bend, Fitting, Valve, Tee, Etc. Utilizing Megalugs, Field Lok Gaskets, or Equals.

The Contractor Shall Provide 18" Vertical Clearance Between Proposed Waterlines and Any Sanitary Sewers. When 18" Clearance Between a Waterline and a Sanitary Sewer Cannot Be Obtained, the Contractor Shall Provide Concrete Encasement as Directed by the Engineer. The Contractor Shall Provide 12" Minimum Clearance Between Waterlines and Storm Sewers. The Contractor Shall Maintain Ten (10) Foot Horizontal Clearance Between Waterlines/services and Sanitary Sewers and Four (4) Foot Horizontal Clearance Between Waterlines/services and Storm Sewers.

Fire Hydrants Shall Be Mueller A423 Meeting the City of Canton Water Department Standards and Requirements. All Costs for the 6" Piping Associated with the Installation of Fire Hydrants Shall Be Included with the Fire Hydrant Pay Item. All Hydrants Shall Be Installed with the Pumper Nozzle Facing the Street.

The Proposed Facilities Shall Maintain a Minimum 35 Psi Pressure Delivered to the Curb Stop During Normal Operating Conditions.

Booster Pumps Are Not Permitted on Service Connections.

All Ductile Iron Pipe, Including Fittings and Appurtenances Buried Underground, Shall Be Encased with 8 Mil. Polyethylene Film Conforming to AWWA C105.

The contractor shall take any and all necessary precautions to protect and maintain in service, any existing water mains exposed during construction.

Any water service line that is broken, cut or otherwise damaged, shall be replaced from the corporation stop to the curb stop with a single piece of plastic service line (Driscoplex). No splicing of the service line will be permitted.

Service branches will be installed as per O.D.O.T Item 638.16, with the following exceptions:

1. When a service branch is disturbed for lowering, raising, extending or shortening on the property side on the service stop, it shall be replaced with new materials from the corporation stop to the service stop.

In a street improvement, no existing water curb box will be left in the pavement, curb and gutter or sidewalk. The curb box will be moved to a suitable location determined by the Canton Water Department. When the curb box is moved, all new material will be used from the corporation stop to the curb stop which is a single piece of plastic service line (Driscoplex). No splicing of the service line will be permitted. A new tap (corporation stop) and curb stop and box may also be required. The determination will be made by the Canton Water Department.

All water mains will be installed under the pavement with a minimum of 3 feet from the edge of pavement or the curb and/or gutter. In existing streets, a saw cut will be made to ensure a clean edge.

When an existing water main must be shut down to perform required work, the properties to be effected shall be given a minimum 24 HOUR notice of said shut down. The work will be scheduled and coordinated to minimize the time the main is out of service.

The contractor shall notify the City 48 hours in advance of any shut down of an existing main. The contractor will not operate any valves. Valves will be operated by Canton Water Department personnel only. Valves damaged by the contractor's operation will be replaced at the contractor's expense.

All valve boxes will be adjusted to final grade of surrounding pavement or finished surface treatments when the project is completed.

Polyethylene Water Main and Service Tubing 2" and under shall be copper tube size and meet standards ASTM-D2737 PE3408 and AWWA C906. The only accepted tubing is CP Chem Performance Pipe Driscoplex 5100-Ultra-line.

Any digging within the Right-of-Way of any street requires a road opening permit. Please contact the appropriate governmental entity for information regarding the permitting process and/or fees due.

Regardless of the service line size, the water service from the curb box to the facility, must be installed by a City of Canton licensed plumber. A City of Canton plumbing permit must be issued to the plumber installing the service line before the water service can be installed.

ESTIMATED QUANTITIES

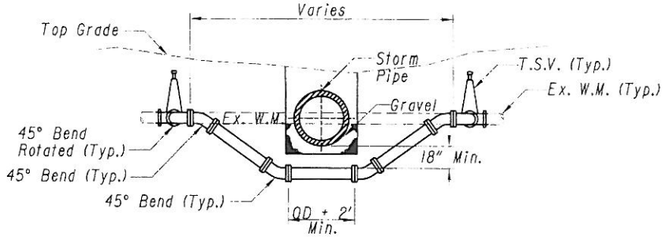
ITEM	ITEM EXT.	TOTAL	UNIT	DESCRIPTION
638	01300	115	FT	8" WATER MAIN DUCTILE IRON ANSI CLASS 53 MECHANICAL JOINTS AND FITTINGS
638	09400	2	EACH	8" X 8" TAPPING SLEEVE, VALVE AND VALVE BOX
638	11200	1	EACH	METER, SETTING, STOP AND CHAMBER
638	65800	2	EACH	SPECIAL-CUT AND PLUG 8" WATER LINE

TOTALS CARRIED TO GENERAL SUMMARY

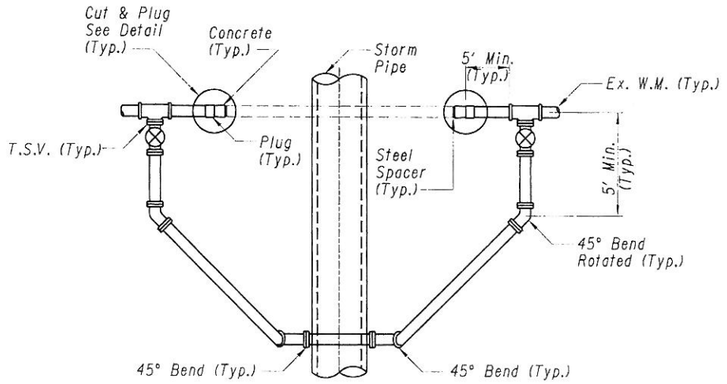
SJF
JBD

WATERLINE GENERAL NOTES

GUILFORD AVE. NW
BRIDGE REPLACEMENT

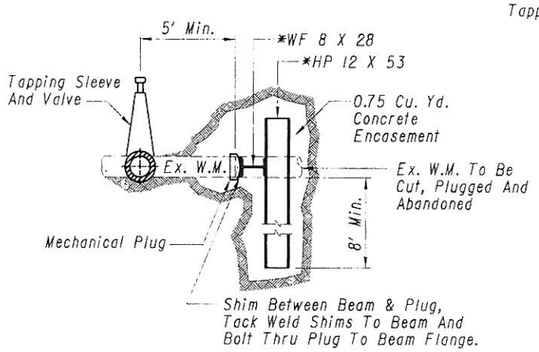


PROFILE

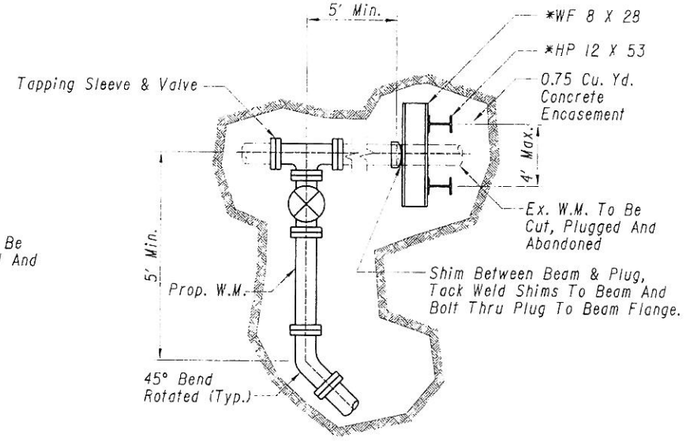


PLAN VIEW

WATER MAIN LOWERING DETAIL



SIDE VIEW



TOP VIEW

TYPE "I" CUT & PLUG DETAIL

WITH ABANDONED WATER MAIN REMOVED

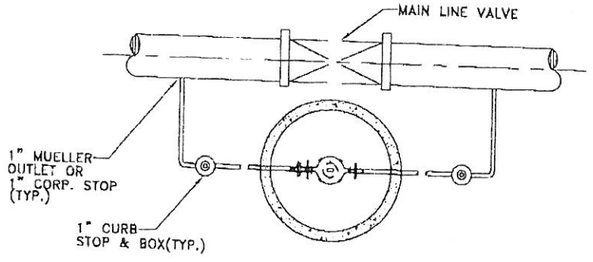
NOTE:
THE MINIMUM OF 5' BETWEEN THE CUT & PLUG AND THE PROPOSED EXCAVATION FOR THE SEWER SHALL BE MAINTAINED UNLESS IT IS DETERMINED IN THE FIELD THAT LESS THAN 5' SEPERATION CAN BE CONSTRUCTED.

* TYPICAL FOR 6" PIPE: LARGER DIAMETERS WILL REQUIRE BEAMS TO BE SIZED ACCORDINGLY

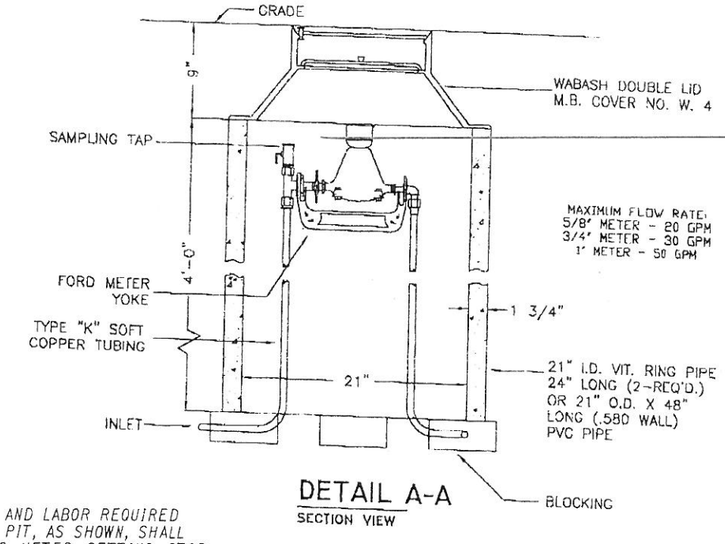
PROCEDURES IN LOWERING WATER MAIN:

1. INSTALL 2-8" X 8" TAPPING SLEEVE AND VALVE (T.S.V.)
2. INSTALL BYPASS WITH LOCKING SEAL RESTRAINED JOINTS. USE US PIPE FIELD LOK GASKET OR APPROVED EQUAL.
3. CUT AND PLUG EXISTING MAIN AFTER CITY OF CANTON WATER DEPARTMENT PERSONNEL HAS TURNED OFF PROPER VALVES.
4. AS PER TEN STATE STANDARDS 8.7.2 INSTALL 1" TAP AT LOCATIONS DIRECTED BY CITY OF CANTON WATER DEPARTMENT FOR TESTING, FLUSHING & PURITY SAMPLING POINT (SEE CURB METER PIT DETAILS).

CURB METER PIT DETAILS



DETAIL A-A
OVERHEAD VIEW



DETAIL A-A
SECTION VIEW

NOTE:
ALL MATERIALS, EQUIPMENT, AND LABOR REQUIRED TO CONSTRUCT CURB METER PIT, AS SHOWN, SHALL BE INCLUDED WITH ITEM 638, METER, SETTING, STOP AND CHAMBER FOR PAYMENT.

DESIGNED SJF
CHECKED JBD

WATERLINE DETAILS

GUILFORD AVE. NW
BRIDGE REPLACEMENT

SHEET NUMBER										ITEM	ITEM EXT.	GRAND TOTAL	UNIT	DESCRIPTION	SEE SHEET NO.
3	4	5	6	7	8	9									
														ROADWAY	
										201	11000	LUMP		CLEARING AND GRUBBING	
										202	38700	16	EACH	GUARDRAIL POST REMOVED	
				374						203	10000	374	CU YD	EXCAVATION	
				127						203	20000	127	CU YD	EMBANKMENT	
				375						204	10000	375	SQ YD	SUBGRADE COMPACTION	
				125						606	13000	125	FT	GUARDRAIL, TYPE 5	
				3						606	25000	3	EACH	ANCHOR ASSEMBLY, TYPE A	
				1						606	26500	1	EACH	ANCHOR ASSEMBLY, TYPE T	
				4						606	35000	4	EACH	BRIDGE TERMINAL ASSEMBLY, TYPE 1	
				1139						608	10000	1139	SQ FT	4" CONCRETE WALK	
				224						609	26000	224	FT	CURB, TYPE 6	
				0.05						642	00100	0.05	MILE	EDGE LINE, TYPE 1	
				0.03						642	00300	0.03	MILE	CENTER LINE, TYPE 1	
														EROSION CONTROL	
	250									207	30100	250	FT	PERIMETER FILTER FABRIC FENCE	
				75						601	32104	75	CU YD	ROCK CHANNEL PROTECTION, TYPE B WITH FABRIC FILTER	
	36									659	00300	36	CU YD	TOPSOIL	
	321			321						659	10000	321	SQ YD	SEEDING AND MULCHING	
	16									659	14000	16	SQ YD	REPAIR SEEDING AND MULCHING	
	16									659	15000	16	SQ YD	INTER-SEEDING	
	0.05									659	20000	0.05	TON	COMMERCIAL FERTILIZER	
	0.07									659	30000	0.05	TON	AGRICULTURAL LIME	
	1.78									659	35000	1.78	M GAL	WATER	
														DRAINAGE	
				78						202	35100	78	FT	PIPE REMOVED, 24" AND UNDER	
				1						202	58100	1	EACH	CATCH BASIN REMOVED	
	25									603	00900	25	FT	6" CONDUIT , TYPE B	
	25									603	01400	25	FT	6" CONDUIT , TYPE E	
	25									603	02600	25	FT	8" CONDUIT, TYPE F	
				74						603	04600	74	FT	12" CONDUIT, TYPE C	
				2						604	04100	2	EACH	CATCH BASIN, NO. 2-2A	
				44						605	31100	44	FT	AGGREGATE DRAINS	
														PAVEMENT	
				53						255	20000	53	FT	FULL DEPTH PAVEMENT SAWING	
				66						301	46000	66	CU YD	ASPHALT CONCRETE BASE, PG64-22	
				70						304	20000	70	CU YD	AGGREGATE BASE	
				25						407	14000	25	GALLON	TACK COAT FOR INTERMEDIATE COURSE	
				135						408	10000	135	GALLON	PRIME COAT	
				17						448	46050	17	CU YD	ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE 2, PG64-22	
				12						448	47020	12	CU YD	ASPHALT CONCRETE SURFACE COURSE, TYPE 1, PG64-22	
		115												WATER WORK	
		2								638	01300	115	FT	8" WATER MAIN DUCTILE IRON PIPE ANSI CLASS 53 MECHANICAL JOINTS AND FITTINGS	
		2								638	09400	2	EACH	8" X 8" TAPPING SLEEVE, VALVE AND VALVE BOX	
										638	65800	2	EACH	SPECIAL-CUT AND PLUG 8" WATER LINE (COL. 808)	
														MAINTENANCE OF TRAFFIC	
	0.15									616	10000	0.15	M GAL	WATER	
										614	10000	LUMP	L.S.	Maintenance of Traffic	
														STRUCTURE OVER 20' (FOR QUANTITIES SEE SHEET 13 OF 18)	
										623	10000	LUMP		CONSTRUCTION LAYOUT STAKES	
										624	10000	LUMP		MOBILIZATION	

PRELIMINARY SJF JBD

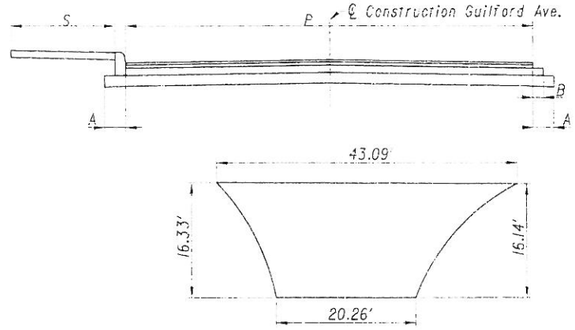
GENERAL SUMMARY

GUILFORD AVE. NW
BRIDGE REPLACEMENT

6
38

PAVEMENT QUANTITIES TABLE

REFERENCE NO.	CARRIED FROM SHT.	STATION FROM/AT	STATION TO	SIDE	LENGTH	P	A	B	204 SUBGRADE COMPACTION	255 FULL DEPTH PAVEMENT SAWING	301 7" ASPHALT CONCRETE BASE, PG64-22	304 6" AGGREGATE BASE	407 TACK COAT FOR INTERMEDIATE COURSE, 0.075 GAL./S.Y.	408 PRIME COAT (0.40 GAL./S.Y.)	448 1½" ASPHALT CONC. SURFACE COURSE, TYPE I PG64-22	448 1¾" ASPHALT CONC. INTERMEDIATE COURSE, TYPE 2 PG64-22
		FROM/AT	TO		FT	FT	FT	FT	SQ YD	FT	CU YD	CU YD	GALLON	GALLON	CU YD	CU YD
P1	7	14+45.00	14+76.42	℄	31.42	24.00	1.00	0.50	94.26	26.34	16.63	15.13	6.28	34.21	2.91	4.07
P2	7	14+76.42	15+70.00	℄	93.58	24.00	1.00	0.00	280.74	26.03	48.52	45.06	18.72	99.82	8.67	12.13
DR1	7	14+29.05	15+72.14	LT								8.97				
TOTALS									375	52.37	65.15	69.16	25	134.03	11.58	16.20
TOTALS CARRIED TO GENERAL SUMMARY									375	53	66	70	25	135	12	17



ITEM 304 = 484.48 SQ. FT. x 0.5 FT. x 1/27 = 8.97 CU. YD.

STONE DRIVE - DR1

DRAINAGE & EROSION CONTROL TABLE

REFERENCE NO.	CARRIED FROM SHT.	STATION FROM/AT	STATION TO	SIDE	202 PIPE REMOVED, 24" AND UNDER	202 CATCH BASIN REMOVED	601 ROCK CHANNEL PROTECTION, TYPE C WITH FABRIC FILTER	603 12" CONDUIT TYPE C	604 CATCH BASIN, NO. 2-2A
		FROM/AT	TO		FT	EACH	CU YD	FT	EACH
R1	7	14+64.22	14+90.20	LT	28				
R2	7	14+64.22	-	LT		1			
R3	7	14+15.00	14+64.22	LT	50				
D1	7	14+15.00	-	LT					1
D2	7	14+40.00	-	LT					1
D3	7	14+15.00	14+40.00	LT				28	
D4	7	14+40.00	14+86.00	LT				46	
D5	7	14+88.28	14+90.93	LT&RT			53.82		
D6	7	15+23.26	15+27.58	LT&RT			21.19		
TOTALS					78	1	75.01	74	2
TOTALS CARRIED TO GENERAL SUMMARY					78	1	75	74	2

WALK & CURB TABLE

REFERENCE NO.	CARRIED FROM SHT.	STATION FROM/AT	STATION TO	SIDE	LENGTH	S	608 4" CONCRETE WALK	609 CURB, TYPE 6
		FROM/AT	TO		FT	FT	SQ FT	FT
W1	6	14+50.00	14+87.25	LT	37.25	5.00	186.25	
W2	6	14+76.42	14+87.25	RT	10.83	5.00	54.15	
W3	6	14+87.25	15+25.59	LT & RT	38.34	5.92	453.95	
W4	6	15+25.59	15+70.00	LT & RT	44.41	5.00	444.10	
C1	6	14+45.00	15+70.00	LT	125			125
C2	6	14+71.42	15+70.00	RT	98.58			98.58
TOTALS							1138.45	223.58
TOTALS CARRIED TO GENERAL SUMMARY							1139	224

PAVEMENT MARKING TABLE

REFERENCE NO.	CARRIED FROM SHT.	STATION FROM/AT	STATION TO	SIDE	642 EDGE LINE, TYPE I	642 CENTER LINE, TYPE I
		FROM/AT	TO		MILE	MILE
-	-	14+45.00	15+70.00	LT	0.024	
-	-	14+45.00	15+70.00	RT	0.024	
-	-	14+45.00	15+70.00	℄		0.024
TOTALS CARRRIED TO GENERAL SUMMARY					0.05	0.03

GUARDRAIL TABLE

REFERENCE NO.	CARRIED FROM SHT.	STATION FROM/AT	STATION TO	SIDE	606 GUARDRAIL, TYPE 5	606 ANCHOR ASSEMBLY, TYPE A	606 ANCHOR ASSEMBLY, TYPE T	606 BRIDGE TERMINAL ASSEMBLY, TYPE 1
		FROM/AT	TO		FT	EACH	EACH	EACH
G1	7	14+33.11	14+89.36	LT	31.25	1		1
G2	7	14+62.36	14+89.36	RT	31.25		1	1
G3	7	15+23.48	15+79.73	RT	31.25	1		1
G4	7	15+23.48	15+79.73	LT	31.25	1		1
TOTALS					125	3	1	4
TOTALS CARRIED TO GENERAL SUMMARY					125	3	1	4

EARTHWORK TABLE

CARRIED FROM SHT.	STATION FROM/AT	STATION TO	203 EXCAVATION	203 EMBANKMENT	870 SEEDING AND MULCHING
			CU YD	CU YD	SQ YD
	ROADWAY				
9	14+45.00	14+87.25	110	63	169
9	15+25.59	15+70.00	112	64	90
	CHANNEL				
10	21+92.74	23+32.74	152	0	62
TOTALS			374	127	321
TOTALS CARRIED TO GEN. SUMMARY			374	127	321

AGGREGATE DRAINS TABLE

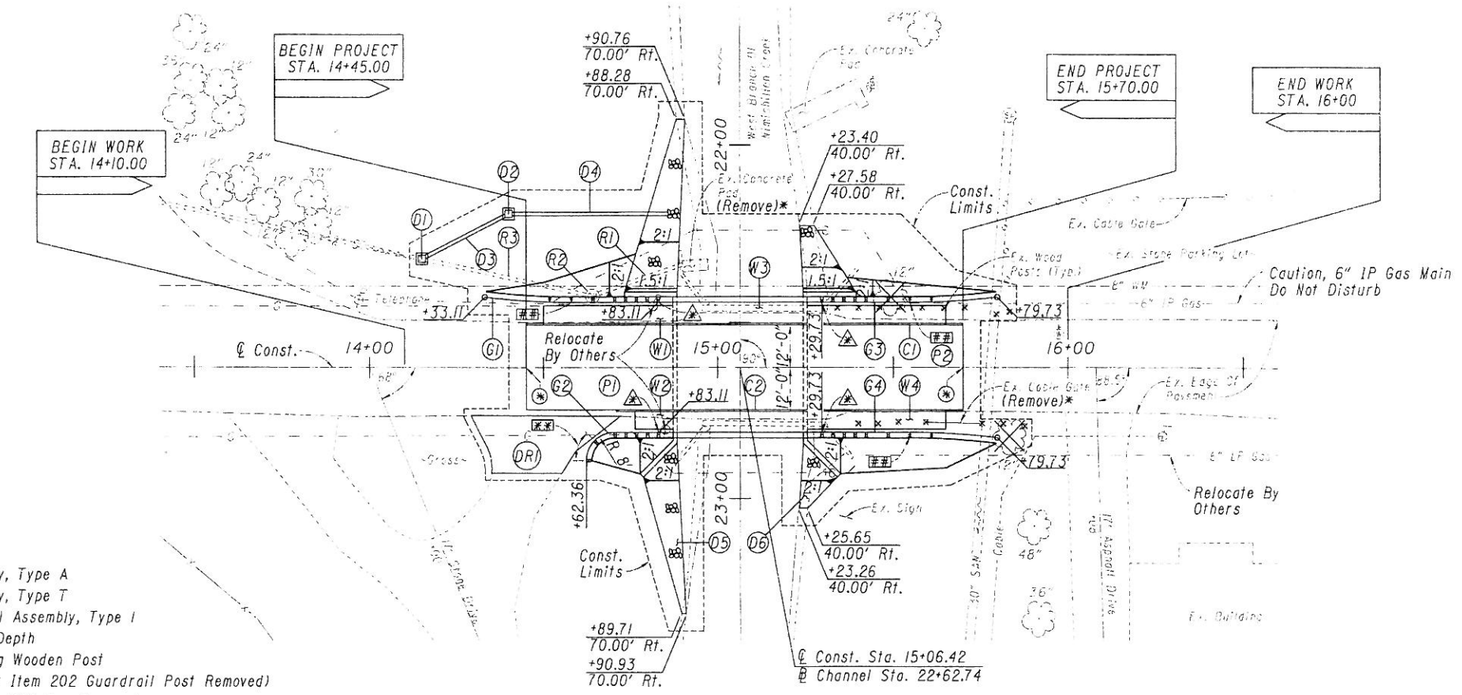
605 AGGREGATE DRAINS	STATION ℄	605 AGGREGATE DRAINS
LEFT		RIGHT
FT		FT
11.00	14+45	
	14+70	11.00
13.00	15+45	
	15+70	9.00
	44.00	

TOTAL CARRIED TO GENERAL SUMMARY

SJF JBD

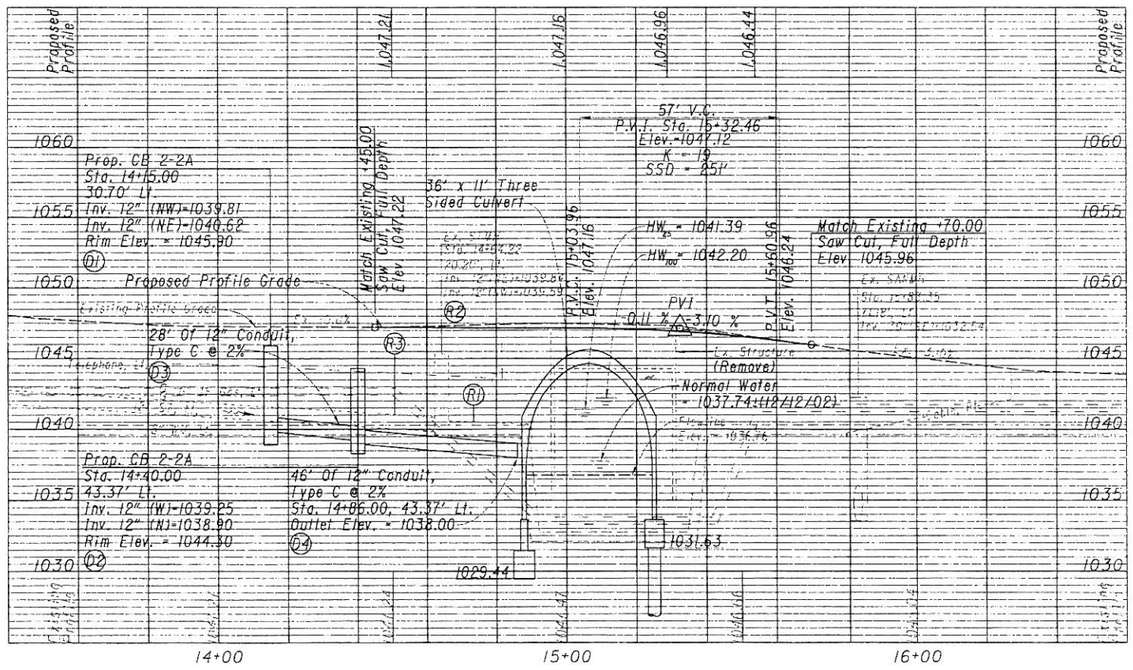
PAVEMENT CALCULATIONS AND SUB-SUMMARIES

GUILFORD AVE. NW
BRIDGE REPLACEMENT



LEGEND:

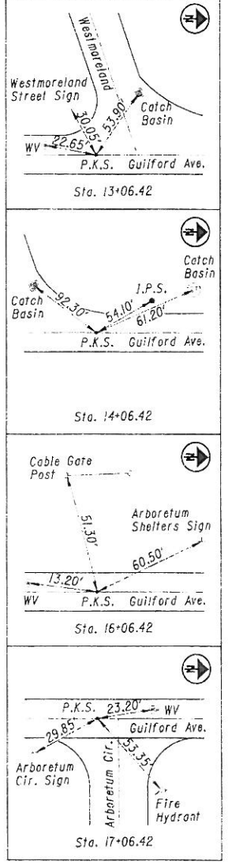
- ## - Anchor Assembly, Type A
- ## - Anchor Assembly, Type T
- - Bridge Terminal Assembly, Type I
- - Saw Cut, Full Depth
- - Remove Existing Wooden Post (Pay For Under Item 202 Guardrail Post Removed)
- * - Include In Item 202 For Payment



BM#300 - Elev.: 1050.65
6" Mag Nail Set In South Corner Of Telephone Pole Sta. 19+19.67, 19.90 Rt.

BM#301 - Elev.: 1054.33
6" Mag Nail Set In East Corner Of Power Pole Sta. 12+83.50, 17.35 Lt.

℄ CONST. REFERENCES



NOTES:

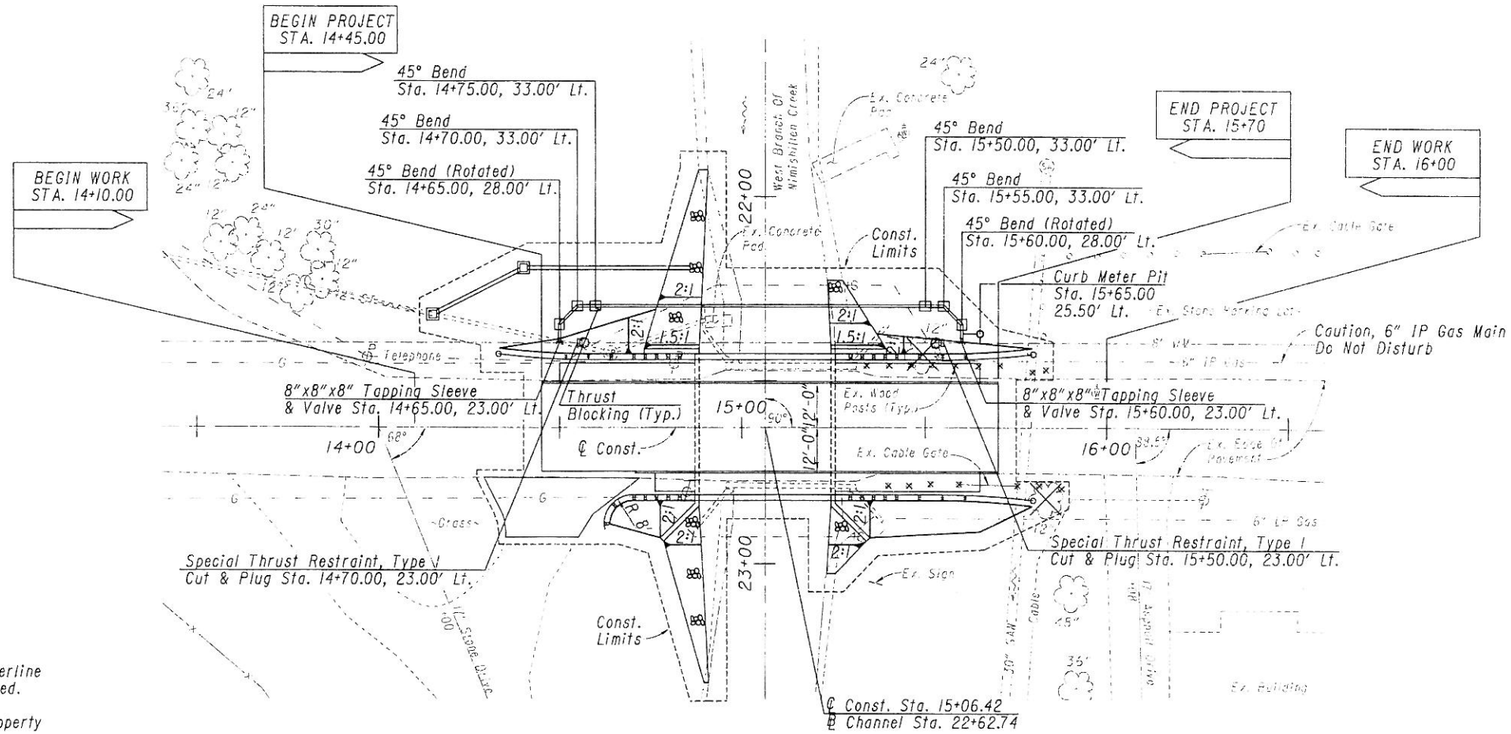
1. All Stationing Is Referenced To Centerline Of Construction Unless Otherwise Noted.
2. All Proposed Work Is Located On Property Owned By The City Of Canton.
3. The Location Of The 6 Inch IP Gas Line Has Been Field Verified.

HORIZONTAL SCALE IN FEET

DESIGNED SJF
DRAWN JBD

PLAN AND PROFILE
STA. 13+40.00 TO STA. 16+60.00

GUILFORD AVE. NW
BRIDGE REPLACEMENT



NOTES:

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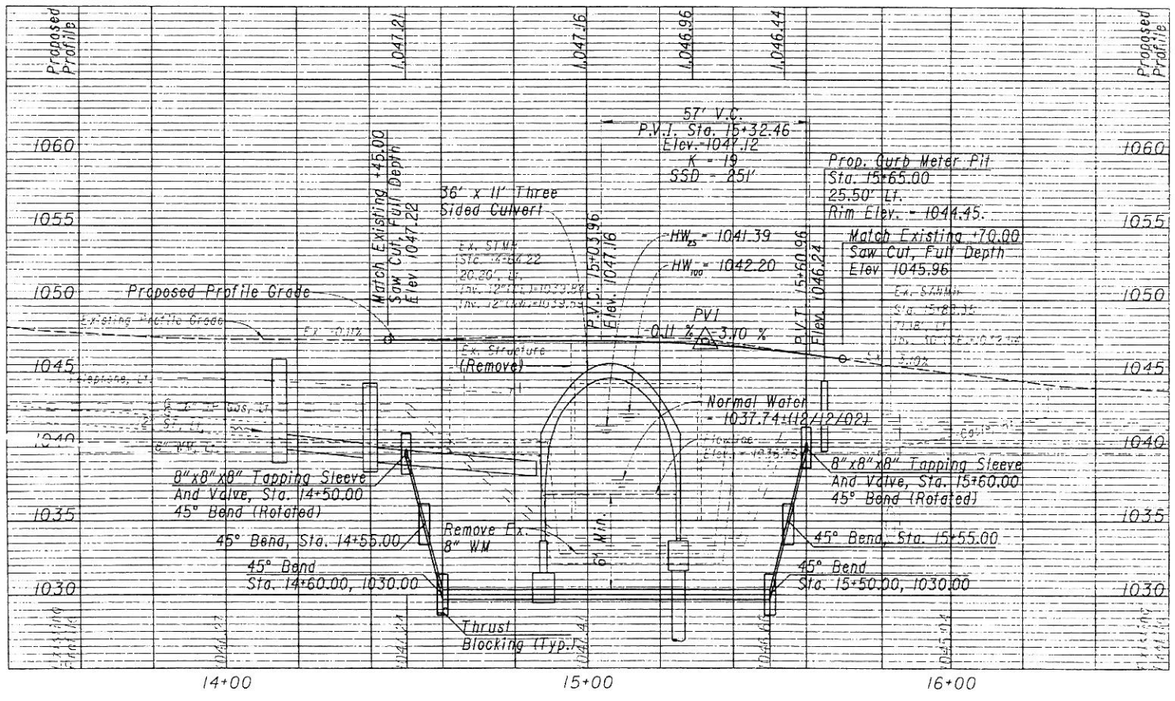
3. The Location Of The 6 Inch IP Gas Line Has Been Field Verified.

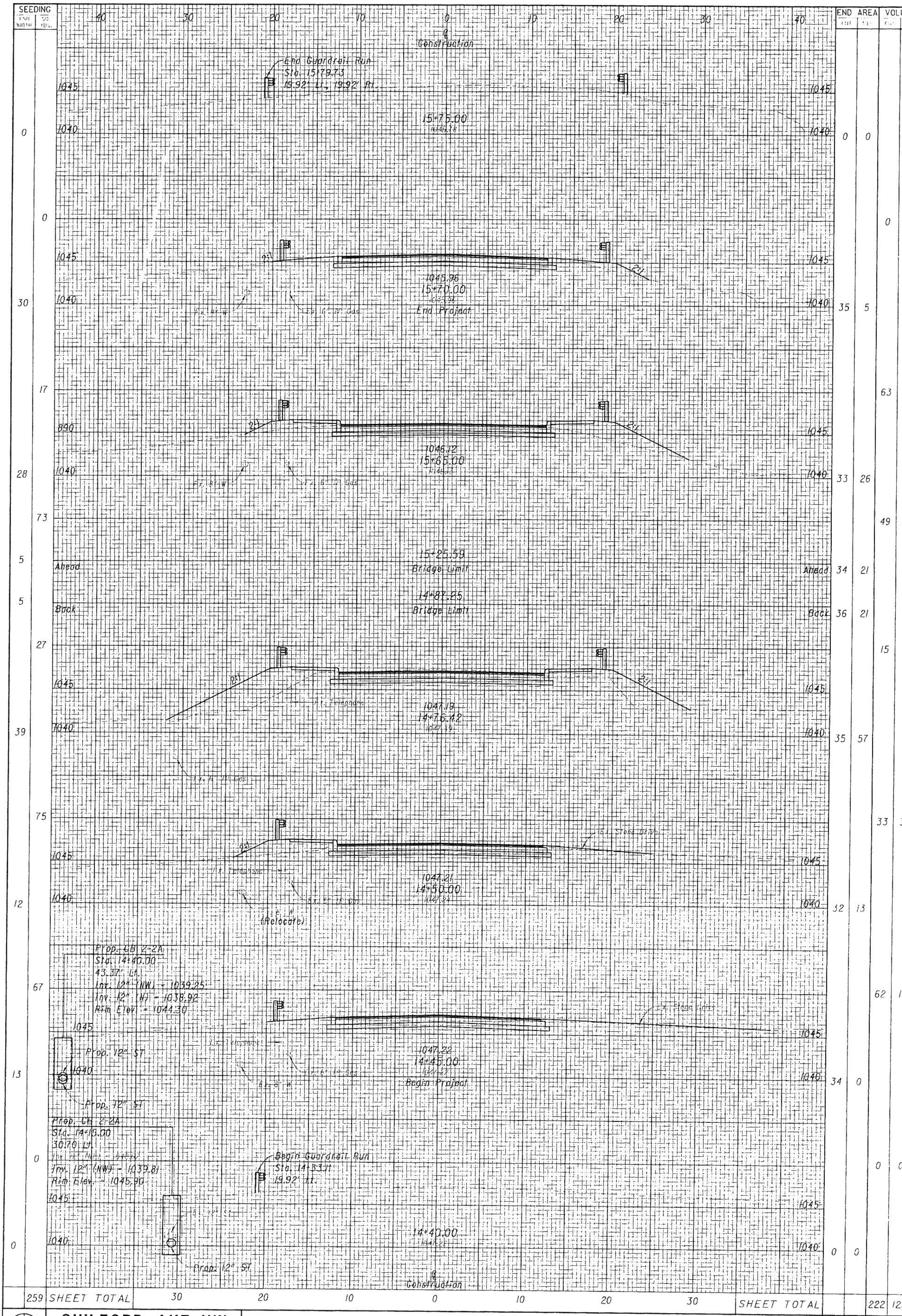


WATERLINE PLAN AND PROFILE
STA. 13+40.00 TO STA. 16+60.00

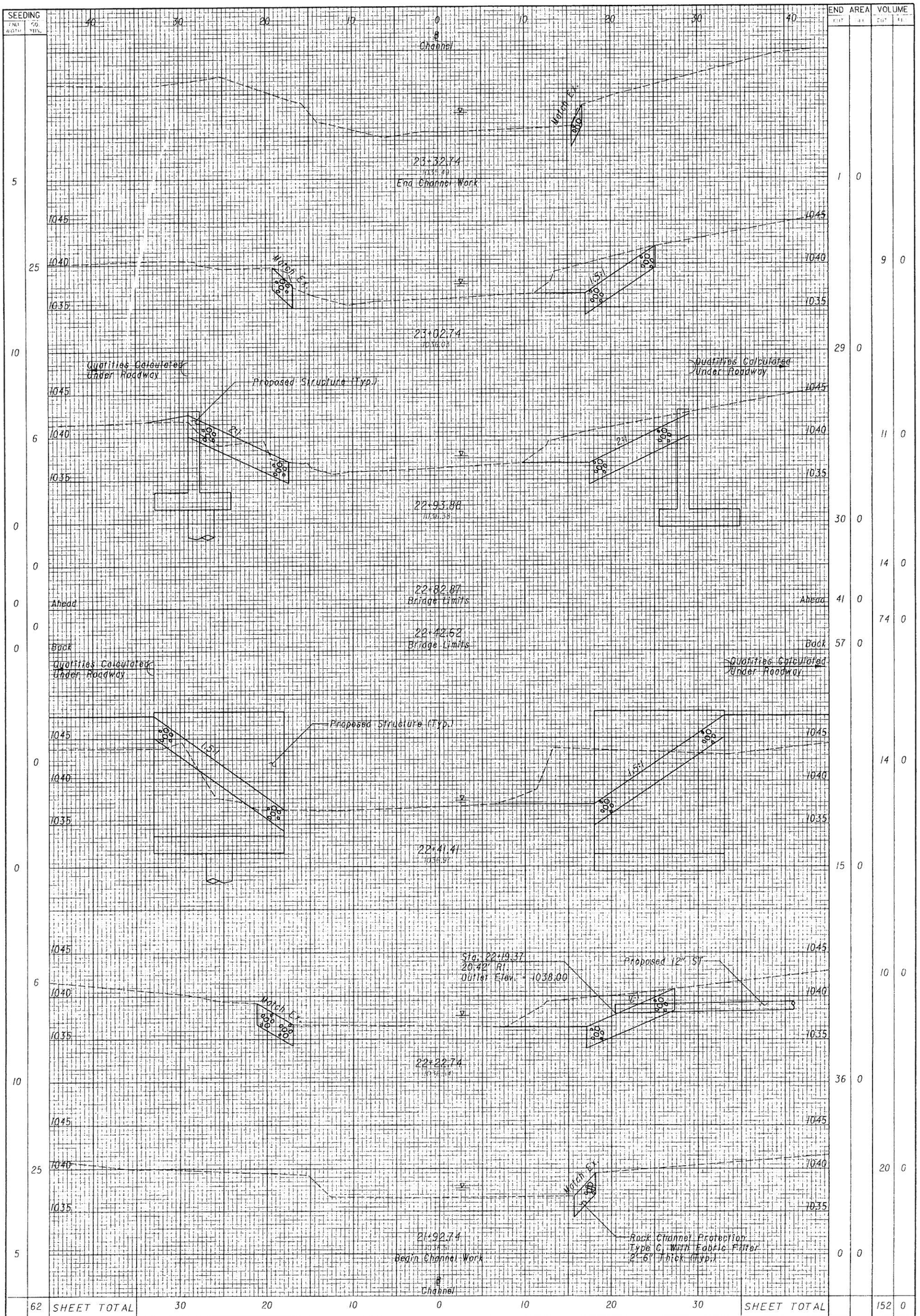
GUILFORD AVE. NW
BRIDGE REPLACEMENT

HORIZONTAL SCALE IN FEET

DESIGNED SJF
CHECKED JBD



GUILFORD AVE. NW BRIDGE REPLACEMENT	CROSS SECTIONS STA. 14+40.00 STA. 15+75.00	SJF JBD



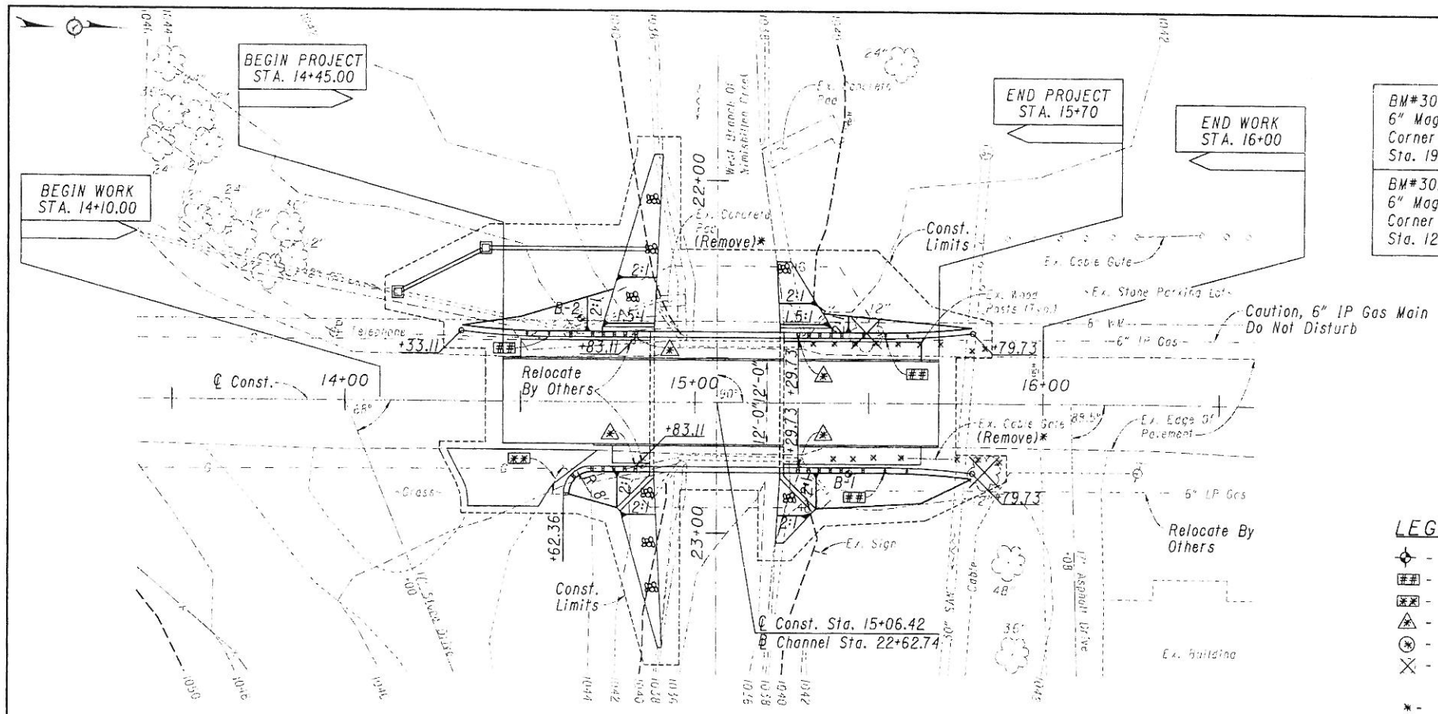
38

GUILFORD AVE. NW BRIDGE REPLACEMENT

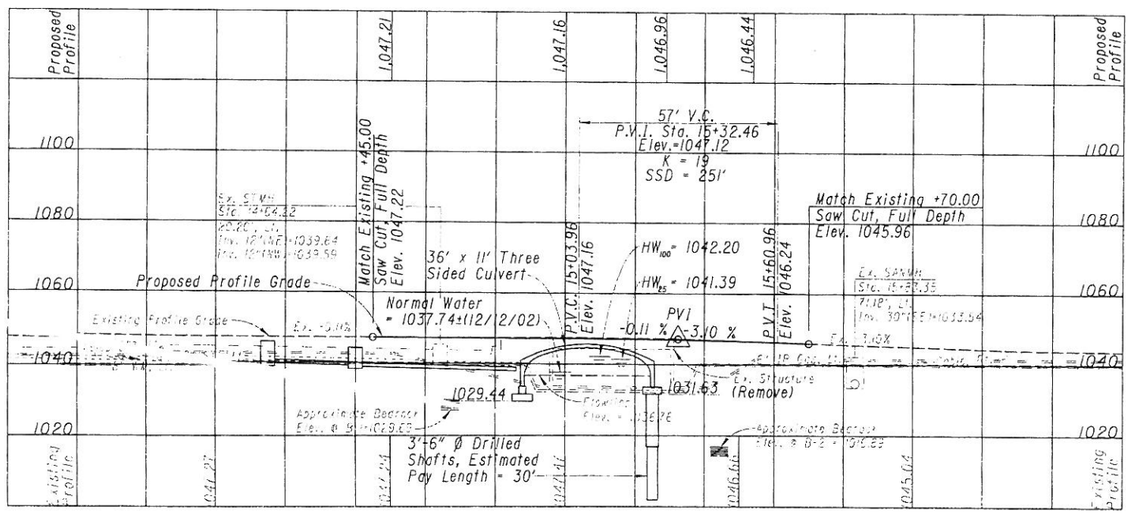
CHANNEL CROSS SECTIONS STA. 21+92.74 TO STA. 23+32.74

SJF

JBD



PLAN



PROFILE AT ℄ CONSTRUCTION

BM#300 - Elev.: 1050.65
6" Mag Nail Set In South Corner Of Telephone Pole Sta. 19+19.67, 19.90 Rt.

BM#301 - Elev.: 1054.33
6" Mag Nail Set In East Corner Of Power Pole Sta. 12+83.50, 17.35 Lt.

TRAFFIC DATA
CURRENT ADT (2002): 5900
DESIGN ADT (2003): 5900
DESIGN ADTT: 177
HYDRAULIC DATA
DRAINAGE AREA: 11.4 SQ. MI.
Q_{25}: 863 cfs Q_{100}: 1090 cfs
VELOCITY: 8.3 fps VELOCITY: 8.61 fps
DEPTH OF FLOW: 5.05 ft DEPTH OF FLOW: 5.86 ft
BACKWATER ELEV.: 1041.39 BACKWATER ELEV: 1042.20
DESIGN YEAR FLOW CLEARS INLET CROWN OF SUPERSTRUCTURE BY 2.43 ft.

SOIL BORING INFORMATION

Boring No.	Station	Offset	Elevation
1	15+44.40	20.12' Rt.	1045.39
2	14+67.24	23.74' Lt.	1044.69

LEGEND:

- ⌖ - Soil Boring Location
- ## - Anchor Assembly, Type A
- ## - Anchor Assembly, Type T
- ⚠ - Bridge Terminal Assembly, Type I
- Ⓢ - Saw Cut, Full Depth
- ✕ - Remove Existing Wooden Post (Include In Item 201 For Payment)
- * - Include In Item 202 For Payment

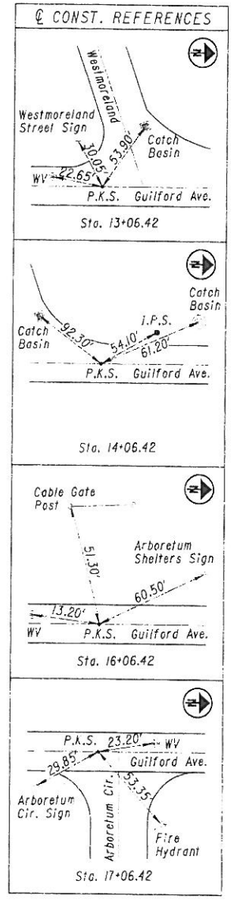
NOTES:

1. All Stationing Is Referenced To Centerline Of Construction Unless Otherwise Noted.
2. All Proposed Work Is Located On Property Owned By The City Of Canton.
3. The Location Of The 6 Inch IP Gas Line Has Been Field Verified.

EXISTING STRUCTURE
STRUCTURE FILE NO.: 6600[illegible]
TYPE: SINGLE SPAN CONCRETE BEAM BRIDGE
SPAN: 35'-0" ±
ROAD WIDTH: 37.1 f/f BRIDGE RAILING
SKEW: NO SKEW
WEARING SURFACE: ASPHALT
ALIGNMENT: TANGENT
SUPERELEVATION: NONE
APPROACH SLAB: NONE
RATE SCALE: SSR
CONDITION: GOOD

PROPOSED STRUCTURE
STRUCTURE FILE NO.:
TYPE: PRE-CAST REINFORCED CONCRETE ARCHED THREE SIDED CULVERT, CON/SPAN LONG SPAN ARCH
SPAN: 36'-0" x 11'-0" x 40'-0" LONG
ROADWAY WIDTH: 24'-0" f/f CURB
LOADING: HS25-44 & ALT. MILITARY
ALIGNMENT: TANGENT
SKEW: NONE
SUPERELEVATION: NONE
WEARING SURFACE: ASPHALT
APPROACH SLAB: NONE
LATITUDE: N40°50'22" LONGITUDE: W81°24'22"

℄ CONST. REFERENCES



NORTHWEST CONSULTANTS, INC
3220 CENTRAL PARK WEST
TOLEDO, OHIO 43617

DESIGNED EEC
DRAWN SJF
CHECKED SJF
QUANTITIES JBD

CITY OF CANTON
STA. 14+87.25
STA. 15+25.59

SITE PLAN
GUILFORD AVE. BRIDGE
OVER WEST BRANCH OF NIMISHILLEN CREEK

GUILFORD AVE. NW
BRIDGE REPLACEMENT

1 / 7

12
38

GENERAL NOTES

"Stone Pattern Form Liner"

Use Dayton/Richmond Form Liner Stone Pattern Number 1538, Or Approved Similar. Stain To Achieve Earth Tone Color, As Approved By The Engineer. Stone Pattern Form Liner And Staining Shall Be Included In Pay Item "Class C Concrete, Retaining Wall Or Wingwall Above Footing, As Per Plan".

Design Specifications: This Structure Conforms to "Standard Specifications for Highway Bridges" Adopted By The American Association Of State Highway And Transportation Officials, 2002, And The ODOT Bridge Design Manual.

Standard Drawings: BR-2-98 Revised 07/19/02

Supplemental Specification: 864 Dated 07/11/00
898 Dated 06/09/04

Design Loading: HS25-44 And Alternate Military Loading
Future Wearing Surface (FWS) of 60 psf.

Design Data: Concrete Class C - Compressive Strength 4000 psi (Footing and Wingwalls)
Reinforcing Steel - ASTM A615 Or A996 Grade 60 Minimum Yield Strength 60,000 psi
Spiral Reinforcement May Be Plain Bars, ASTM A82 Or A615

Foundation Bearing Pressure: Precast Three Sided Culvert Footings, As Designed, Produce A Maximum Bearing Pressure Of 2 Tons Per Square Foot. The Allowable Bearing Pressure Is 5 Tons Per Square Foot.

Footings Shall Extend a Minimum Of 3" Into Bedrock Or To The Elevation Shown, Whichever Is Lower.

Drilled Shafts: The Design Load To Be Supported By Each Drilled Shaft Is 103 Tons At The Precast Three Sided Culvert Footings And 84 Tons At The Wingwalls. The Load Is Resisted By Shaft Adhesion Within A Portion Of The Bedrock Socket And Also By Shaft End Bearing. The Allowable Bedrock Socket Adhesion Is 0.75 Tons Per Square Foot, Assumed To Act Along The Bottom 15 Feet Of The Bedrock Socket For The Three Sided Culvert And The Wingwalls. The Allowable End Bearing Pressure Is 5 Tons Per Square Foot. The Reinforcing Steel Is To Be Epoxy Coated According To 709.00.

Utility Lines: The Utilities Shall Bear All Expense Involved In Relocating The Affected Utility Lines. The Contractor And The Utilities Are To Cooperate By Arranging Their Work In Such A Manner That Inconvenience To Either Will Be Held To A Minimum.

Three-Sided Culvert Wall And Top Slab Thickness: Shown On The Plans Were Obtained From The Manufacturers At The Time The Plans Were Prepared. If The Wall And/Or Top Slab Thickness Of The Culvert Proposed Are Different From What Is Shown On The Plans, A Marked Copy Of The Project Plans, Including All Plan Notes And Details Showing All Items Affected By The Different Culvert Dimensions, Shall Be Submitted For Approval With The Shop Drawings. All Work Required To Accommodate Any Revised Dimensions Shall Be At No Extra Cost To The Owner.

Concrete Parapets: As Soon As a Concrete Saw Can Be Operated Without Damaging The Freshly Placed Concrete, Sawcut 1¼" Deep Control Joints Into The Perimeter Of The Concrete Parapet Starting And Ending At The Top Of The Precast Headwall. Place The Sawcuts At a Minimum Of 6 Feet And a Maximum Of 10 Feet Centers. Use An Edge Guide, Fence, Or Jig To Ensure That The Cut Joint Is Straight, True, And Aligned On All Faces Of The Parapet. The Joint Width Shall Be The Width Of The Saw Blade, a Nominal Width Of ¼". Seal The Perimeter Of The Deflection Control Joint To A Minimum Depth Of 1" With a Polyurethane Or Polymeric Material Conforming To ASTM C920, Type S. Leave The Bottom ½" Of The Inside And Outside Face Unsealed To Allow Water To Escape.

Precast Wingwalls: The Use Of Precast Wingwalls Shall Be Permitted. If The Contractor Opts To Use Precast Wingwalls He Shall Be Paid The Plan Quantity, At The Bid Price, For Item 511 "Class C Concrete, Retaining Wall Or Wingwall Above Footing".

ESTIMATED QUANTITIES

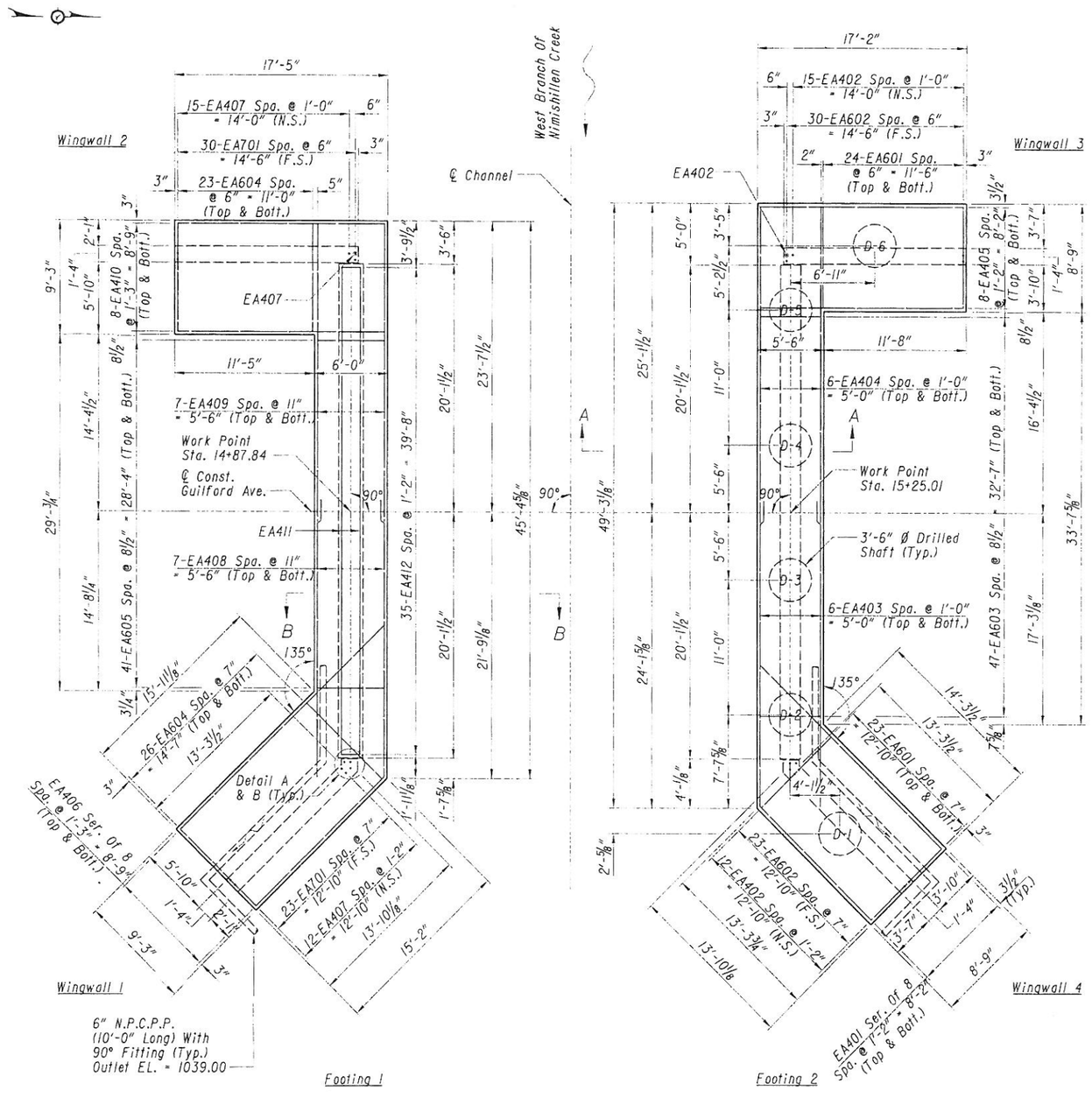
ITEM	ITEM EXT.	TOTAL	UNIT	DESCRIPTION
202	11002	LUMP		STRUCTURE REMOVED, OVER 20 FOOT SPAN
503	11100	LUMP		COFFERDAMS, CRIBS, AND SHEETING
503	21300	LUMP		UNCLASSIFIED EXCAVATION
509	10000	19231	POUND	EPOXY COATED REINFORCING STEEL
511	46001	42	CU YD	CLASS C CONCRETE, RETAINING WALL OR WINGWALL ABOVE FOOTING, AS PER PLAN
511	46500	79	CU YD	CLASS C CONCRETE, FOOTING
512	33000	260	SQ YD	TYPE 2 WATERPROOFING
516	13600	73	SQ FT	1" PREFORMED EXPANSION JOINT FILLER
517	75121	76.67	FT	RAILING (CONCRETE PARAPET WITH TWIN STEEL TUBE RAILING), AS PER PLAN
518	21230	LUMP		POROUS BACKFILL WITH FILTER FABRIC
518	40000	138	FT	6" PERFORATED CORRUGATED PLASTIC PIPE
518	40010	40	FT	6" NON-PERFORATED CORRUGATED PLASTIC PIPE, INCLUDING SPECIALS
524	94804	180	FT	DRILLED SHAFTS, 42" DIAMETER, INTO BEDROCK
603	71000	40	FT	CONDUIT, TYPE A, PRECAST REINFORCED CONCRETE ARCH SECTIONS (36' SPAN x 11' RISE)
864	10100	170	SQ YD	SEALING OF CONCRETE SURFACES (EPOXY-URETHANE)
898	SPECIAL	128	CU YD	CONCRETE QC

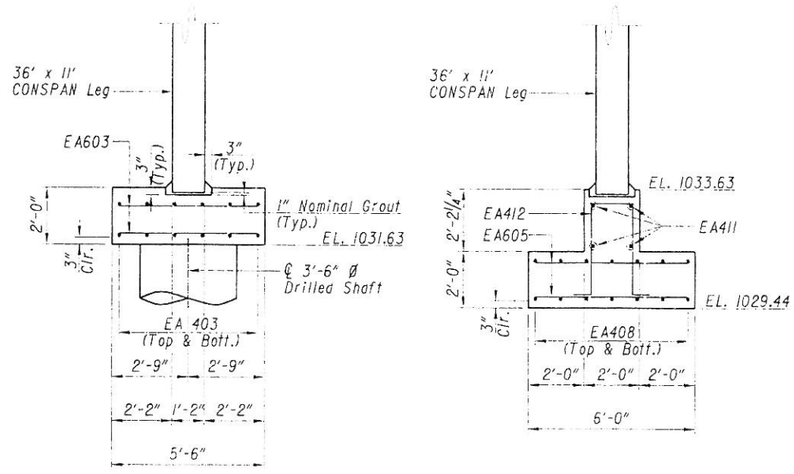
NORTHWEST CONSULTANTS, INC
3220 CENTRAL PARK WEST
TOLEDO, OH 43617

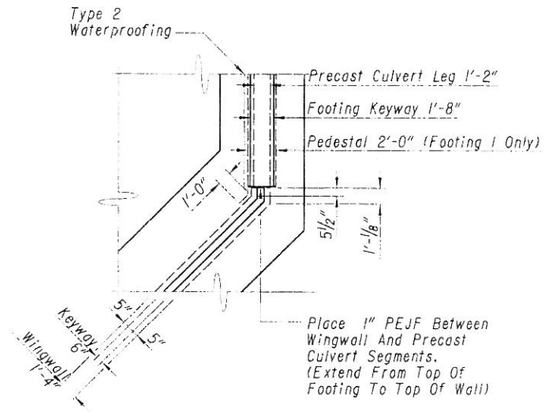
DESIGN AGENCY | DATE
CHECKED: SJF | DRAWN: SJF | REVISED: EEC
CHECKED: SJF | CHECKED: JBD | REVISED: ---
STRUCTURE FILE NUMBER

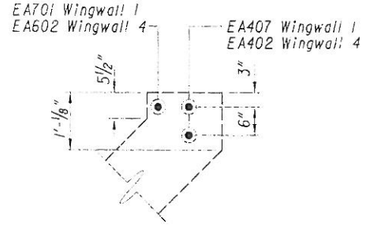
GENERAL STRUCTURE NOTES AND QUANTITIES
GUILFORD AVE. BRIDGE
OVER WEST BRANCH OF NIMISHILLEN CREEK

GUILFORD AVE. NW
BRIDGE REPLACEMENT









NORTHWEST CONSULTANTS, INC
3220 CENTRAL PARK WEST
TOLEDO, OHIO 43617

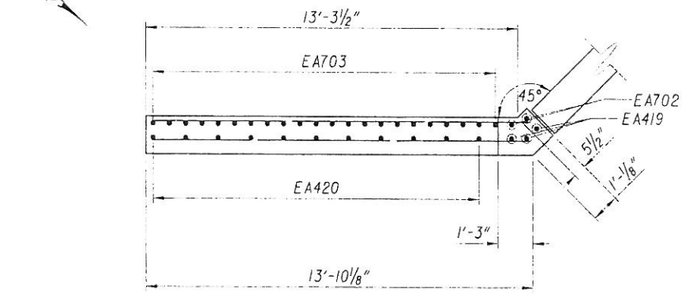
DESIGNED SJF
DRAWN SJF
CHECKED JBD
REVISIONS EEC

SUBSTRUCTURE DETAILS
GUILFORD AVE. BRIDGE
OVER WEST BRANCH OF NIMISHILLEN CREEK

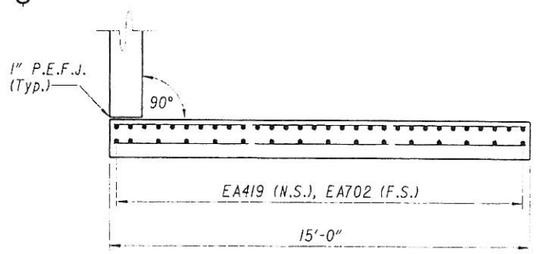
GUILFORD AVE. NW
BRIDGE REPLACEMENT

3 / 7

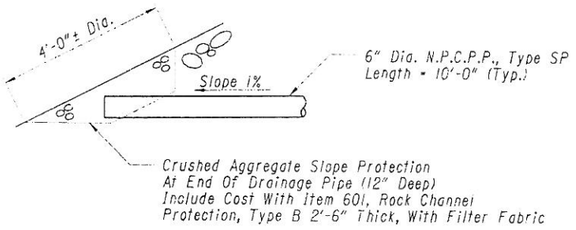
14 / 38



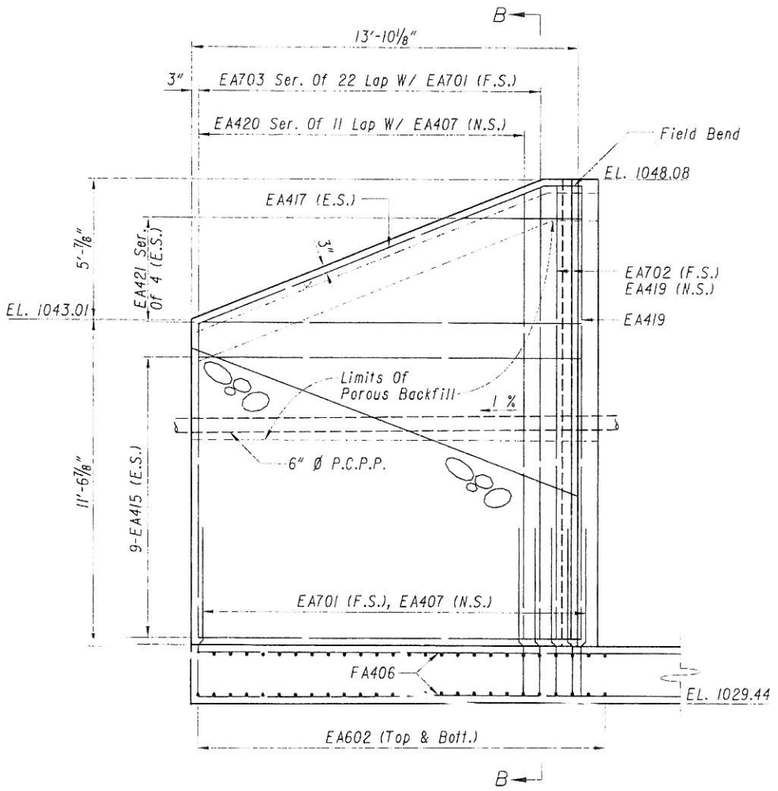
PLAN - WINGWALL 1



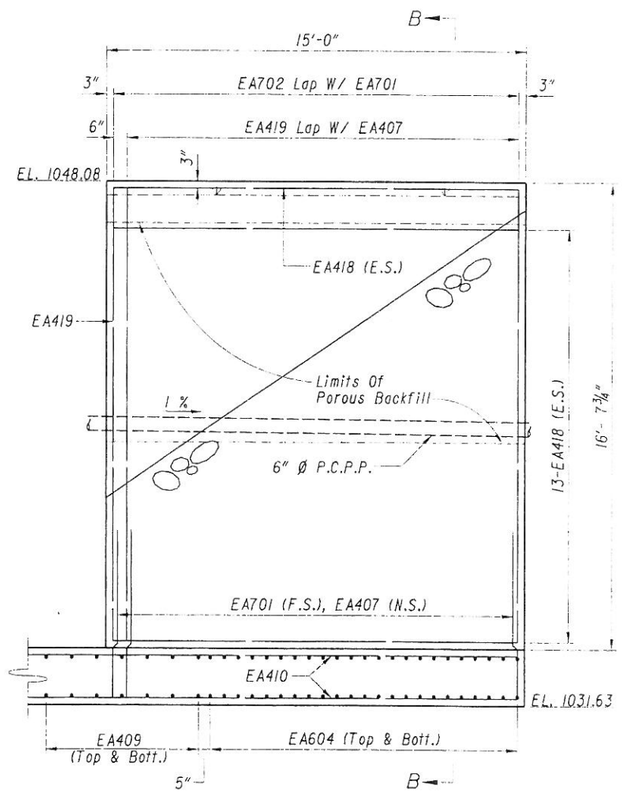
PLAN - WINGWALL 2



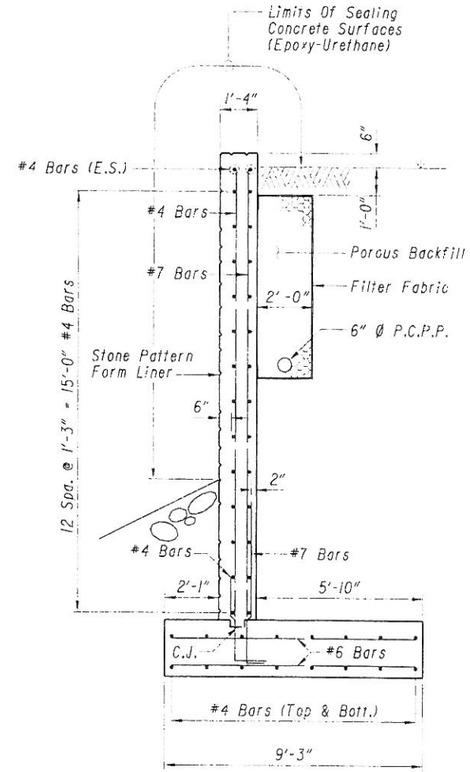
TERMINATION OF 6" N.P.C.P.P. DETAIL



ELEVATION - WINGWALL 1



ELEVATION - WINGWALL 2



SECTION B-B

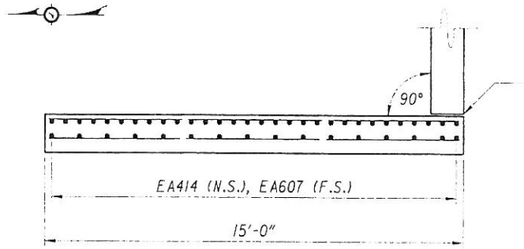
NORTHWEST CONSULTANTS, INC.
3220 CENTRAL PARK WEST
TOLEDO, OH 43617

DESIGNED EEC
DRAWN SJF
CHECKED SJF
QUANTITIES JBD

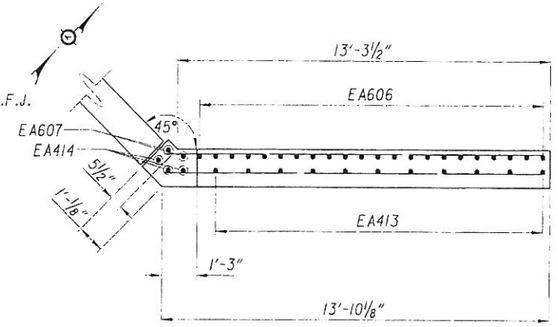
DETAILS
SUBSTRUCTURE DETAILS
GUILFORD AVE. BRIDGE
OVER WEST BRANCH OF NIMISHILLEN CRFEK

GUILFORD AVE. NW
BRIDGE REPLACEMENT

4/7
15/38



PLAN - WINGWALL 3



PLAN - WINGWALL 4

LEGEND:

N.S. - NEAR SIDE

F.S. - FAR SIDE

E.S. - EACH SIDE

P.C.P.P. - PERFORATED CORRUGATED POLYETHYLENE PIPE

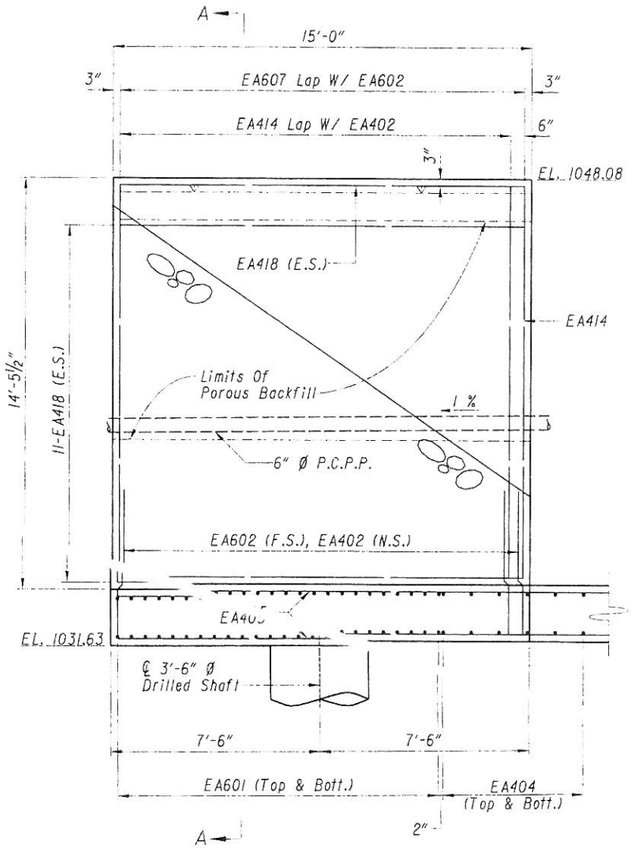
N.P.C.P.P. - NON-PERFORATED CORRUGATED POLYETHYLENE PIPE

NOTES:

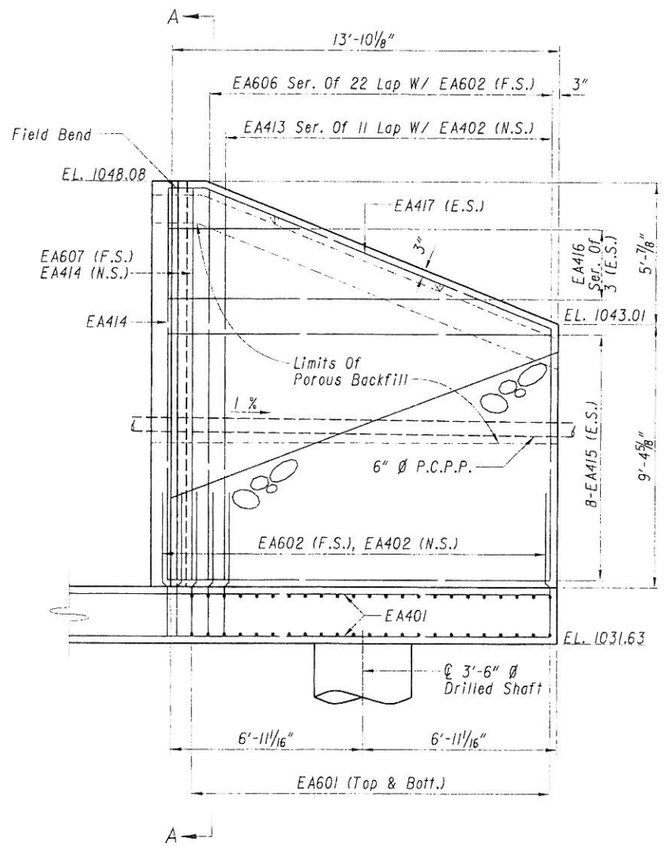
1. MINIMUM BAR LAPS

   LAP NO. 4 BARS 1'-6"
   LAP NO. 6 BARS 3'-4"
   LAP NO. 7 BARS 4'-2"

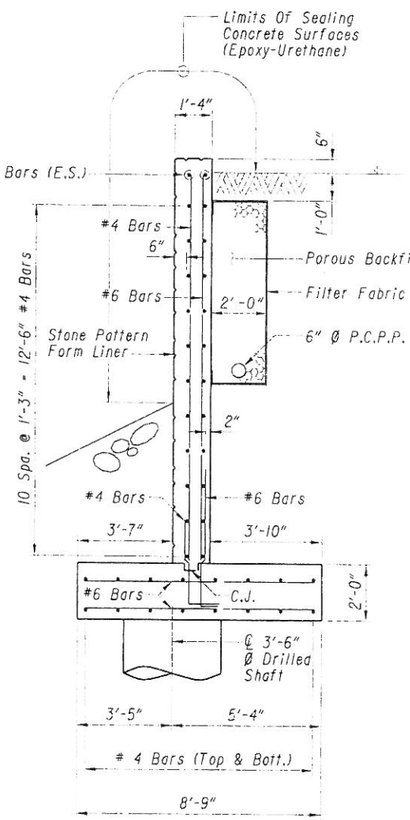
2. POROUS BACKFILL WITH FILTER FABRIC, 2 FEET THICK SHALL EXTEND UP TO THE PLANE OF THE SUBGRADE, TO 1 FOOT BELOW THE EMBANKMENT SURFACE, AND LATERALLY TO THE ENDS OF THE WINGWALLS.



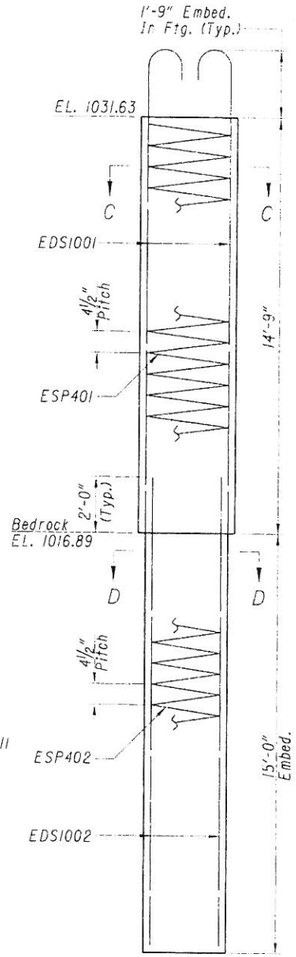
ELEVATION - WINGWALL 3



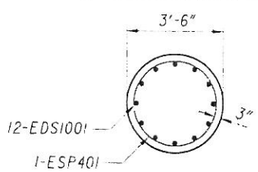
ELEVATION - WINGWALL 4



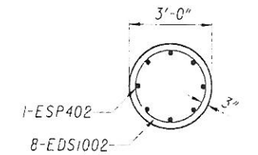
SECTION A-A



ELEVATION DRILLED SHAFT



SECTION C-C



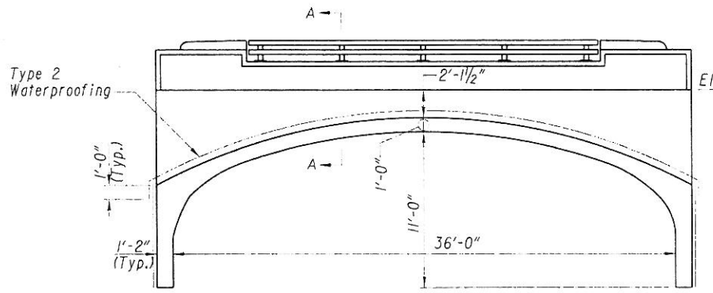
SECTION D-D

NORTHWEST CONSULTANTS, INC
3220 CENTRAL PARK WEST
TOLEDO, OH 43617

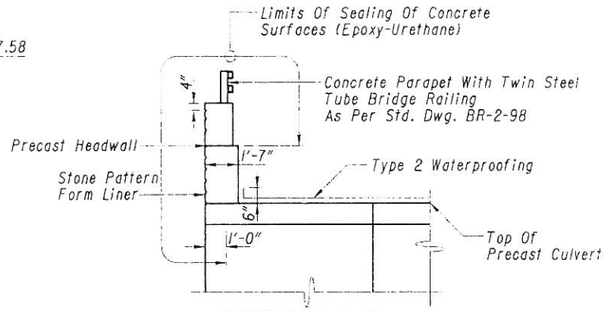
DESIGNED SJF
DETAILED SJF
CHECKED EEC
QUANTITIES SJF
CHECKED JBD

SUBSTRUCTURE DETAILS
GUILFORD AVE. BRIDGE
OVER WEST BRANCH OF NIMISHILLEN CREEK

GUILFORD AVE. NW
BRIDGE REPLACEMENT



ELEVATION VIEW



SECTION A-A

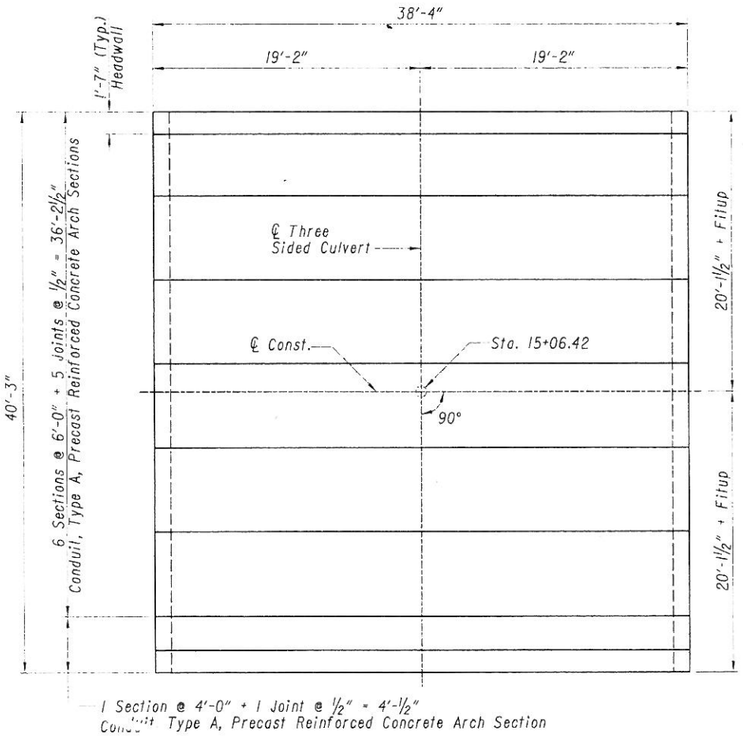
NOTES:

1. "STONE PATTERN FORM LINER"

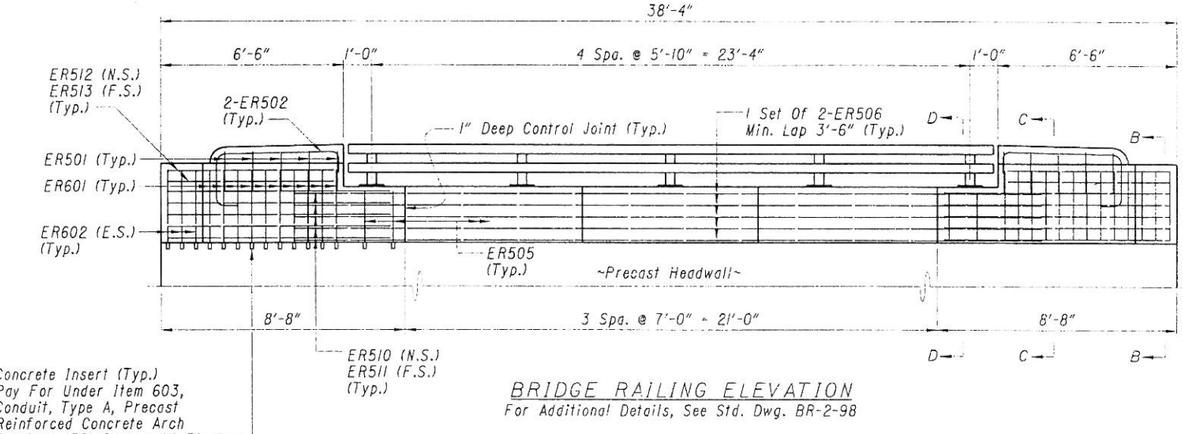
USE DAYTON/RICHMOND FORM LINER STONE PATTERN NUMBER 1538, OR APPROVED SIMILAR. STONE PATTERN FORM LINER FOR PRECAST HEADWALL SHALL BE INCLUDED IN PAY ITEM "CONDUIT, TYPE A, PRECAST REINFORCED CONCRETE ARCH SECTION". CONTRACTOR SHALL INCLUDE STAINING IN PAY ITEM "CLASS C CONCRETE, RETAINING WALL OR WINGWALL ABOVE FOOTING, AS PER PLAN".

2. FLAT-TOP CULVERT ALTERNATE:

IF A FLAT-TOP CULVERT IS USED THE SPAN AND RISE SHALL MATCH THOSE SHOWN IN THESE PLANS.



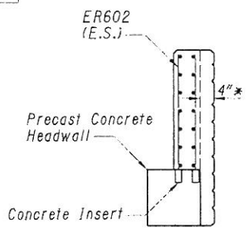
PLAN VIEW



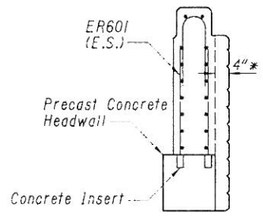
BRIDGE RAILING ELEVATION

For Additional Details, See Std. Dwg. BR-2-98

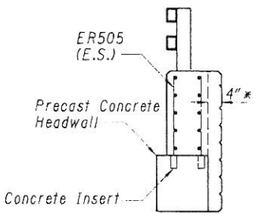
Concrete Insert (Typ.)
Pay For Under Item 603,
Conduit, Type A, Precast
Reinforced Concrete Arch
Sections (36' Span x 11' Rise)



SECTION B-B



SECTION C-C



SECTION D-D

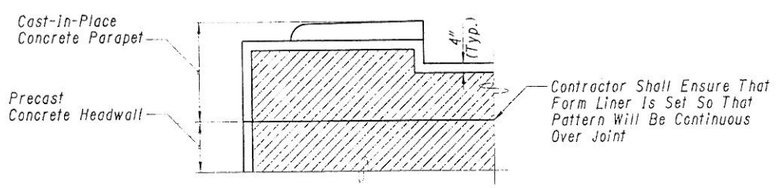
* 4" Of Additional Concrete Shall Be Added To The Thickness Of The Concrete Parapet To Account For The Form Liner Pattern. This Concrete Shall Not Be Included in Reinforcement Cover.

LEGEND:

N.S. - NEAR SIDE

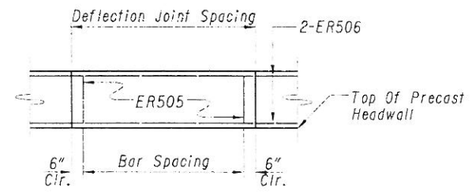
F.S. - FAR SIDE

E.S. - EACH SIDE



BRIDGE RAILING AESTHETIC DETAIL

PARAPET REINFORCING STEEL TABLE		
Deflection Joint Spacing	Number Of ER505	Spacing For ER505
8'-8"	4	12"
7'-0"	14	12"



TYPICAL PARPAET PANEL REINFORCING LAYOUT

NORTHWEST CONSULTANTS, INC.
3220 CENTRAL PARK WEST
TOLEDO, OH 43617

DESIGNED EEC
DRAWN SJF
CHECKED SJF
QUANTITIES JBD

PRECAST AND PARAPET DETAILS
GUILFORD AVE. BRIDGE
OVER WEST BRANCH OF NIMISHILLEN CREEK

GUILFORD AVE. NW
BRIDGE REPLACEMENT

6 / 7

17
38

REINFORCING STEEL LIST

MARK	NUMBER	LENGTH	WEIGHT	TYPE	DIMENSIONS A	B	C	INC.
		SUBSTRUCTURE						
EA401	2 SERIES OF 8	13'-0" TO 21'-2"	182	STR.				1'-2"
EA402	30	3'-8"	73	3	3'-3"	6"		
EA403	12	24'-9"	198	STR.				
EA404	12	25'-7"	205	STR.				
EA405	16	16'-10"	180	STR.				
EA406	2 SERIES OF 8	14'-10" TO 23'-6"	204	STR.				1'-3"
EA407	30	3'-8"	73	3	3'-3"	6"		
EA408	14	22'-5"	210	STR.				
EA409	14	24'-1"	225	STR.				
EA410	16	17'-4"	185	STR.				
EA411	4	39'-8"	106	STR.				
EA412	35	9'-2"	214	2	1'-8"	3'-5"	3'-5"	
EA413	1 SERIES OF 11	9'-3" TO 13'-10"	169	STR.				5½"
EA414	19	14'-3"	181	STR.				
EA415	34	13'-6"	307	STR.				
EA416	2 SERIES OF 3	4'-9" TO 11'-0"	32	STR.				3'-1½"
EA417	4	14'-6"	39	1	13'-4"	1'-1"	5¼"	
EA418	52	14'-8"	509	STR.				
EA419	19	16'-5"	208	STR.				
EA420	1 SERIES OF 11	11'-5" TO 16'-0"	1339	STR.				5½"
EA421	2 SERIES OF 4	4'-2" TO 13'-5"	78	STR.				3'-1"
EA601	94	8'-5"	1188	STR.				
EA602	54	5'-8"	460	3	5'-1"	9"		
EA603	94	5'-2"	729	STR.				
EA604	98	8'-11"	1313	STR.				
EA605	82	5'-8"	698	STR.				
EA606	1 SERIES OF 22	9'-3" TO 14'-1"	772	STR.				2¾"
EA607	32	14'-3"	685	STR.				
EA701	54	6'-8"	736	3	5'-11"	11"		
EA702	32	16'-5"	1074	STR.				
EA703	1 SERIES OF 22	11'-5" TO 16'-3"	6659	STR.				2¾"
		TOTAL	19231					

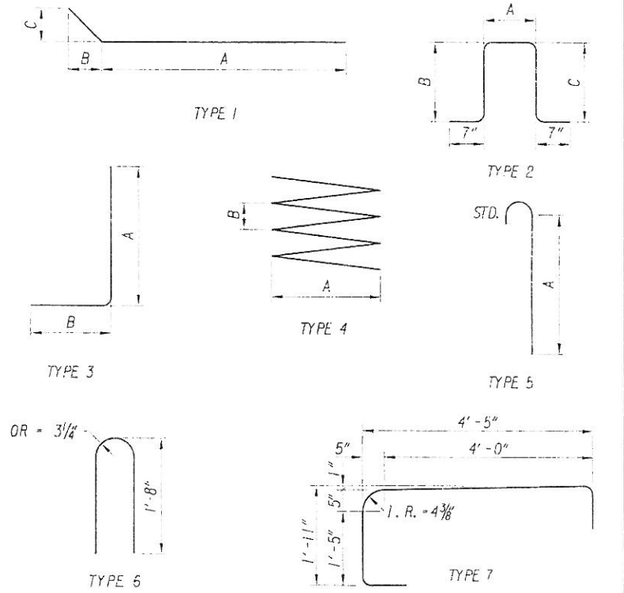
REINFORCING STEEL LIST

MARK	NUMBER	LENGTH	WEIGHT	TYPE	DIMENSIONS A	B	C	INC.
		DRILLED SHAFTS						
*EDS1001	72	17'-4"	5370	5	15'-11"			
*EDS1002	48	17'-3"	3511	STR.				
*ESP401	6	14'-7"	1560	4	3'-0"	4½"		
*ESP402	6	16'-10"	1488	4	2'-6"	4½"		
		TOTAL	11929					
		RAILING						
**ER501	20	3'-7"	75	6				
**ER502	8	7'-6"	63	7				
**ER505	100	1'-10"	191	STR.				
**ER506	20	25'-3"	527	STR.				
**ER510	20	8'-3"	172	1	6'-10"	1'-4"	4"	
**ER511	20	8'-3"	172	STR.				
**ER512	8	6'-1"	51	1	4'-8"	1'-4"	4"	
**ER513	8	6'-2"	51	STR.				
**ER601	80	2'-8"	320	STR.				
**ER602	24	2'-8"	96	STR.				
		TOTAL	1718					

* FOR REFERENCE ONLY, PAY FOR UNDER ITEM 542, DRILLED SHAFTS, 42" DIAMETER, INTO BEDROCK.

** FOR REFERENCE ONLY, PAY FOR UNDER ITEM 517, RAILING (CONCRETE PARAPET WITH TWIN STEEL TUBE RAILING)

BENDING DIAGRAM



NOTES:

1. THE BAR SIZE NUMBER IS SPECIFIED ON THE PLANS IN THE BAR MARK COLUMN THE FIRST DIGIT WHERE THREE DIGITS ARE USED, AND THE FIRST TWO DIGITS WHEN FOUR DIGITS ARE USED, INDICATES THE BAR SIZE NUMBER. FOR EXAMPLE, P601 IS A No.6 BAR. BAR DIMENSIONS SHOWN ARE OUT TO OUT UNLESS OTHERWISE NOTED. "R" INDICATES INSIDE RADIUS, UNLESS OTHERWISE NOTED. "STD." WRITTEN IN PLACE OF A DIMENSION INDICATES A STANDARD BEND AT THE END OF THE BAR.

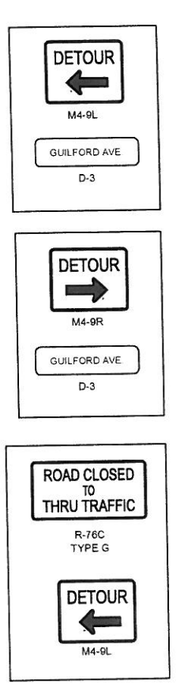
2. ALL REINFORCING STEEL TO BE EPOXY COATED.

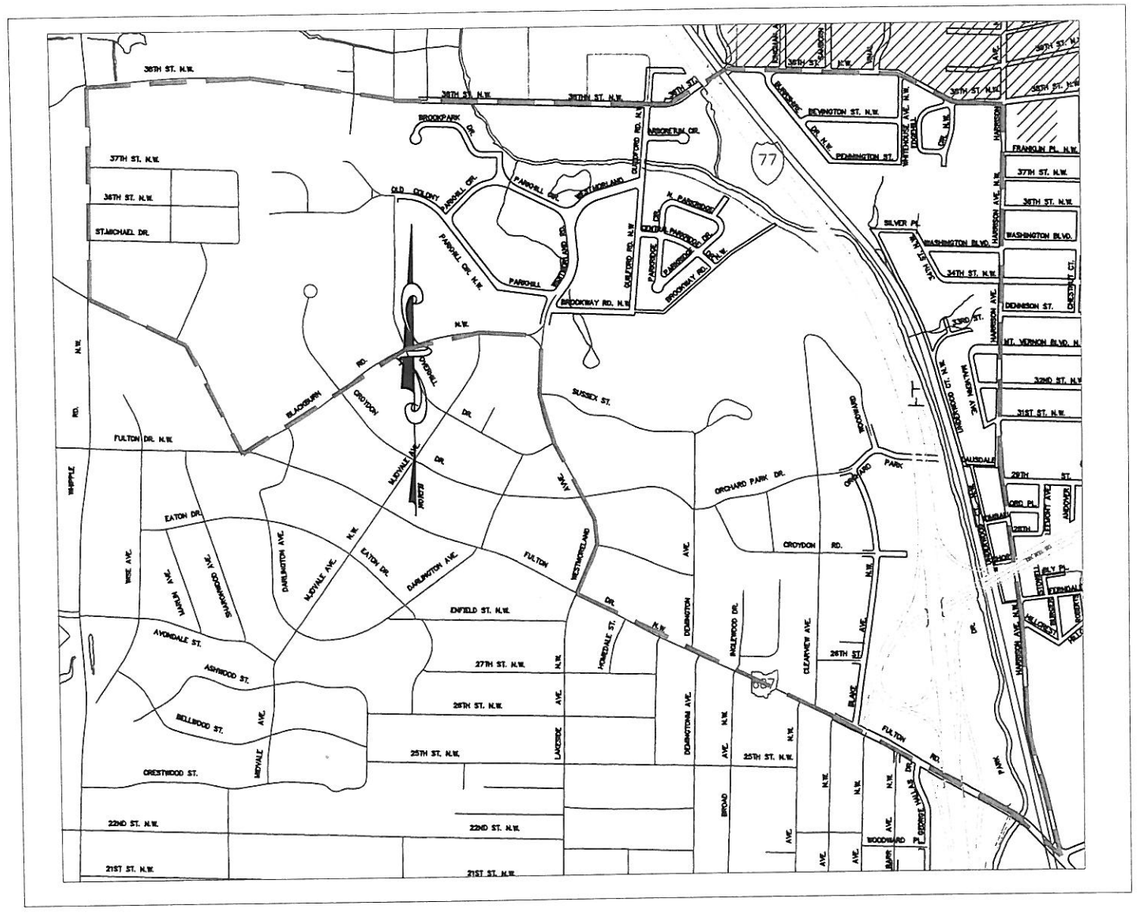
NORTHWEST CONSULTANTS, INC.
3220 CENTRAL PARK WEST
TOLEDO, OHIO 43617

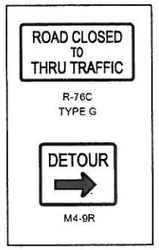
DESIGNED EEC
DRAWN SJF
CHECKED SJF
QUANTITIES JBD

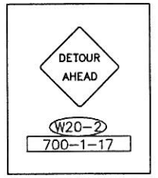
REINFORCING STEEL LIST
GUILFORD AVE. NW BRIDGE REPLACEMENT
OVER WEST BRANCH OF NIMISHILLEN CREEK

GUILFORD AVE. NW
BRIDGE REPLACEMENT









TRAFFIC NOTES:

(A) MAINTAINING TRAFFIC:

THE CONTRACTOR SHALL MAINTAIN TRAFFIC ADJACENT TO THE PROJECT AS DESCRIBED BELOW AND IN ACCORDANCE WITH THE REQUIREMENTS OF THE OHIO DEPARTMENT OF TRANSPORTATION MANUAL OF CONSTRUCTION AND MATERIALS SPECIFICATIONS ITEM 614 MAINTAINING TRAFFIC. THE CONTRACTOR SHALL FURNISH, MAINTAIN, AND REMOVE ALL SIGNS, FLAGS, FLAGMEN, WATCHMEN, BARRICADES, SIGN SUPPORTS, CONES, BARRELS, AND INCIDENTALS IN CONFORMANCE WITH THE MOST RECENT REVISIONS OF THE CURRENT EDITION OF THE OHIO MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES FOR STREETS AND HIGHWAYS. INTERFERENCE WITH VEHICULAR TRAFFIC SHALL BE KEPT TO A MINIMUM AT ALL TIMES. ALL OPEN TRENCHES AND EXCAVATIONS SHALL BE PROTECTED WITH DRUMS, BARRICADES, OR BARRIERS. ACCESS SHALL BE MAINTAINED AT ALL TIMES FOR EMERGENCY AND FIRE DEPARTMENT VEHICLES.

ANY TEMPORARY ROADWAY CLOSING MUST BE APPROVED IN WRITING BY THE CITY TRAFFIC ENGINEER AND ANY OTHER PUBLIC AGENCY HAVING JURISDICTION. THE CONTRACTOR SHALL NOTIFY THE TRAFFIC ENGINEER AT LEAST 72 HOURS IN ADVANCE OF ANY SUCH CLOSINGS FOR PUBLICATION AND EMERGENCY AGENCY NOTIFICATION.

(B) RESIDENTIAL AREAS:

THE CONTRACTOR SHALL MAINTAIN ACCESS TO LOCAL RESIDENCES AND BUSINESSES DURING CONSTRUCTION. IN THE EVENT A DRIVE ACCESS NEEDS TO BE CLOSED, THE CONTRACTOR SHALL GIVE NOTICE OF CLOSURE AND DURATION TO THE PROPERTY OWNER 24 HOURS IN ADVANCE. CONTRACTOR SHALL ARRANGE FOR ALTERNATE PARKING AND REASONABLE ACCESS FOR THOSE PROPERTY OWNERS AFFECTED BY DRIVE CLOSURES.

(C) EXISTING STREET NAME AND TRAFFIC CONTROL SIGNS:

WHERE WORK REQUIRES THE MOVEMENT OF EXISTING SIGNS (STOP SIGNS, SPEED LIMIT SIGNS, NO PARKING SIGNS, ETC.). THE CONTRACTOR IS REQUIRED TO MAINTAIN THE FUNCTION OF ALL TRAFFIC CONTROL SIGNS. ALL SIGNS REMOVED BY THE CONTRACTOR SHALL BE STORED ON SITE AND REINSTALLED BY THE CONTRACTOR.

BID ITEM 614 MAINTENANCE OF TRAFFIC

TYPE III BARRICADES MUST BE PROVIDED AND MAINTAINED DAILY BY THE CONTRACTOR FOR ROAD CLOSURE. DURING THE PERIOD WHEN GUILFORD AVE. NW IS CLOSED FOR THE BRIDGE REPLACEMENT, THE CONTRACTOR SHALL ERECT SIGNS AND BARRICADES TO DIRECT TRAFFIC DETOURS ACCORDING TO THE ABOVE DETOUR ROUTE. AS PART OF THE LUMP SUM BID FOR MAINTENANCE OF TRAFFIC, CONTRACTOR SHALL INCLUDE ALL SIGNS, BARRICADES, SIGN SUPPORTS, CONES, BARRELS, ETC., AS NECESSARY TO DENOTE THESE DETOUR ROUTES. BEFORE CONSTRUCTION BEGINS, CONTRACTOR SHALL SUBMIT A MAINTENANCE OF TRAFFIC PLAN TO TRAFFIC ENGINEERING DEPT. FOR APPROVAL. AUTHORIZATION TO COMMENCE WORK WILL NOT BE ISSUED UNTIL THE MAINTENANCE OF TRAFFIC PLAN HAS BEEN APROVED.

(D) TRAFFIC CONTROL PLAN:

THE CONTRACTOR SHALL FOLLOW THE APPROVED PLAN PROVIDED BY THE CONTRACTOR. ANY MODIFICATIONS TO THE PLAN MUST BE SUBMITTED TO THE CITY ENGINEER FOR APPROVAL ON A TRAFFIC CONTROL PLAN IN ACCORDANCE WITH CITY SUPPLEMENTAL SPECIFICATION 01-00.

CONTRACTOR'S EQUIPMENT – OPERATION AND STORAGE:

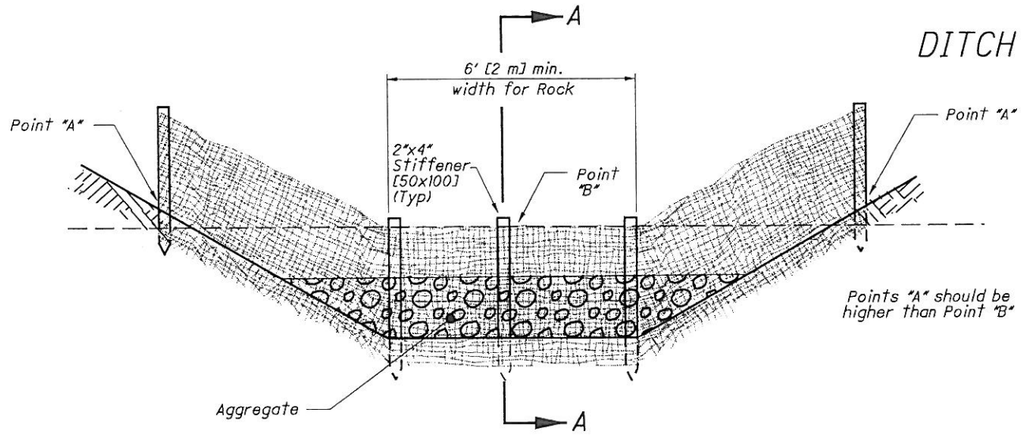
A QUALIFIED FLAGGER SHALL BE EMPLOYED WHERE THE CONTRACTOR'S EQUIPMENT MUST MERGE WITH THE TRAFFIC STREAM. PAVERS, ROLLERS AND OTHER EQUIPMENT MAY BE PARKED ON SITE WITH THE ENGINEER'S APPROVAL, WHEN PARKING ALONG A SIDE STREET, ADEQUATE BARRICADES AND LIGHTS SHALL BE PLACED ON THE PAVEMENT SIDE OF THE EQUIPMENT TO IDENTIFY THE LIMITS OF THE EQUIPMENT. ALL OTHER EQUIPMENT, INCLUDING PRIVATE VEHICLES, SHALL BE STORED AT THE APPROVED CONTRACTOR'S STORAGE AREA. NO EQUIPMENT SHALL BE PARKED ON PRIVATE PROPERTY UNLESS PRIOR APPROVAL OF THE OWNER AND THE PROJECT ENGINEER HAS BEEN GRANTED.

CONSTRUCTION PROJECT NO.
G.P. 1075

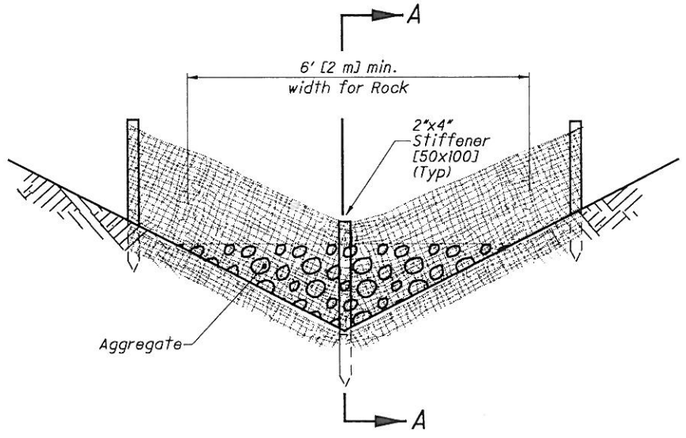
MAINTENANCE OF TRAFFIC PLAN

CITY OF CANTON
GUILFORD RD. NW

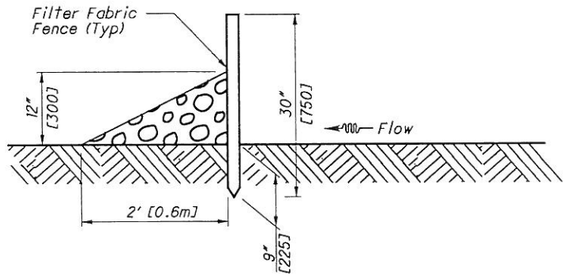
DITCH CHECKS



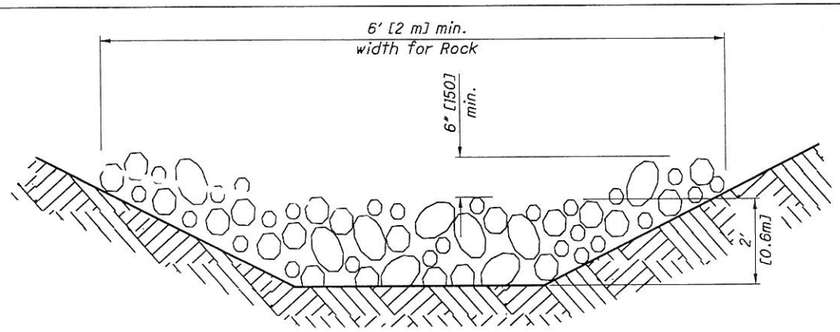
CROSS-SECTIONAL VIEW OF FLAT BOTTOM DITCH



CROSS-SECTIONAL VIEW OF "V" DITCH



PROFILE VIEW OF FLAT BOTTOM AND V DITCH
SECTION A-A



Minimum dimensions: 2' [0.6 m] high x 6' [2 m] wide x 3' [0.9 m] long

CROSS-SECTIONAL VIEW
ROCK CHECK

NOTES

FILTER FABRIC DITCH CHECKS:

MATERIALS:
Furnish filter fabric ditch checks consisting of the following materials:

1. *30" [0.8 m] wide filter fabric with sound wood supports with maximum on-center spacing of 10' [3.0 m]. Use filter fabric conforming to 712.09, Type C.*
2. *A vertically driven 2"x4" [50x100] stiffener stake in the center of the ditch*
3. *Aggregate conforming to one of the following gradations No. 1 through No. 4 on Table 703.01-1.*

When using straw bales, furnish 30" [0.8] long 2"x2" [50x50] wooden stakes, reinforcing bars or fence posts to stake straw bales in place.

CONSTRUCTION:
Trench the filter fabric fence as detailed for PERIMETER FILTER FABRIC FENCE (see Sheet 2). Place a vertical 2"x4" [50x100] stiffener stake in the center of the ditch with the top level to the top of the fence and at least 6" [150] below the bottom of the ditch. Excavate for aggregate and place the aggregate on the downstream side of the ditch check.

If the Engineer determines that rock should not be used for the filter fabric ditch checks, replace aggregate with straw bales configured with minimal gaps between bales. Tightly place each bale adjacent to one another. Entrench 2" [50] to 3" [75] into the ground prior to staking. Firmly stake each bale with at least two stakes.

PAYMENT:
The Department will pay for accepted quantities at the prices shown in Appendix F of Supplemental Specification 832 (SS832) for the following items:

- Filter Fabric Ditch Check

All items shown on this Standard Construction Drawing that are required for construction that are not specifically identified in SS832 Appendix F are considered incidental.

ROCK CHECKS:

MATERIALS:
Furnish material conforming to Item 601 - Rock Channel Protection, Type C or D, without filter.

CONSTRUCTION:
If the Engineer determines that rock should not be used for the rock checks, replace rock channel protection with straw bales configured with minimal gaps between bales. Tightly place each bale adjacent to one another. Entrench 2" [50] to 3" [75] into the ground prior to staking. Firmly stake each bale with at least two stakes.

PAYMENT:
The Department will pay for accepted quantities at the prices shown in Appendix F of Supplemental Specification 832 (SS832) for the following items:

- Rock Channel Protection, Type C or D, without Filter

All items shown on this Standard Construction Drawing that are required for construction that are not specifically identified in SS832 Appendix F are considered incidental.

STATE OF OHIO DEPARTMENT OF TRANSPORTATION
STATE HYDRAULIC ENGINEER

REVISIONS
12-01-08
4-17-09

ROADWAY HYDRAULIC ENGINEER
J. Stains

ALL METRIC DIMENSIONS ( ) ARE IN MILLIMETERS UNLESS OTHERWISE NOTED.

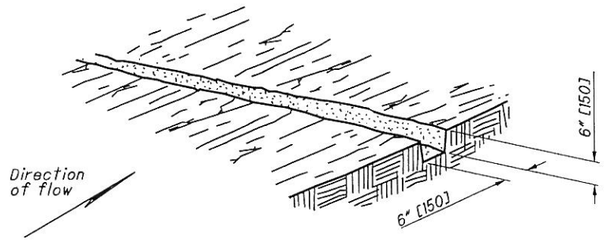
OFFICE OF STRUCTURAL ENGINEERING

STANDARD HYDRAULIC CONSTRUCTION DRAWING
CONSTRUCTION EROSION CONTROL

SCD NUMBER
DM-4.4

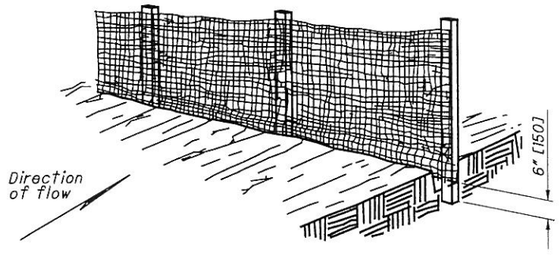
1 / 2

PERIMETER FILTER FABRIC FENCE



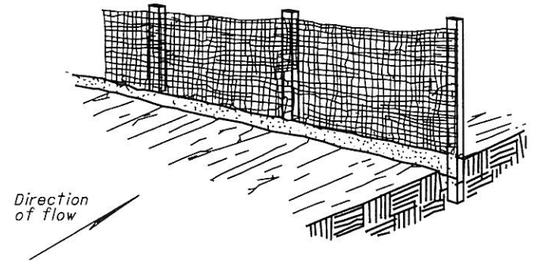
Excavate a 6"x6" [150x150] trench along the proposed fence line.

STEP 1



Place fabric and support stakes and extend fabric into the trench.

STEP 2



Backfill and compact the excavated soil.

STEP 3

NOTES

MATERIALS:

Furnish 30" [0.8 m] wide filter fabric with sound wood supports with maximum on-center spacing of 10' [3.0 m]. Use filter fabric conforming to 712.09, Type C.

CONSTRUCTION:

Trench the filter fabric fence as detailed. The contractor may elect to trench the fence detailed on steps 1 through 3 in one plowing operation.

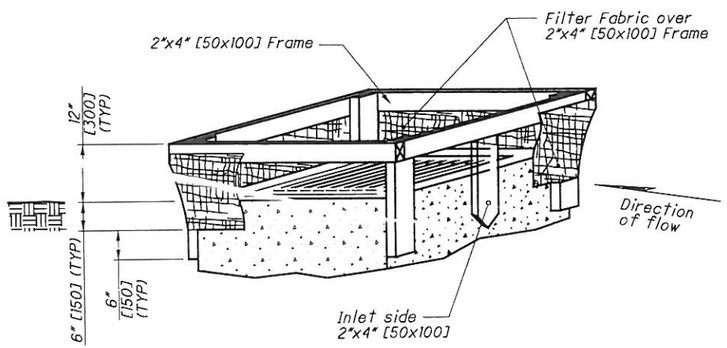
PAYMENT:

The Department will pay for accepted quantities at the prices shown in Appendix F of Supplemental Specification 832 (SS832) for the following items:

- Perimeter Filter Fabric Fence

All items shown on this Standard Construction Drawing that are required for construction that are not specifically identified in SS832 Appendix F are considered incidental.

INLET PROTECTION



INLET PROTECTION

NOTES

MATERIALS:

Furnish inlet protection consisting of 18" [0.5 m] wide filter fabric fence with a securely nailed 2"x4" [50x100] wood frame with a vertically driven 2"x4" [50x100] on the inlet, or flow, side of the structure. Use filter fabric conforming to 712.09, Type C.

CONSTRUCTION:

Construct an 18" [0.5 m] wide filter fabric fence supported around a storm drain inlet or catch basin with a securely nailed 2"x4" [50x100] wood frame. Excavate a 6" [150] trench around the inlet, and drive support posts 6" [150] below the excavated trench bottom. Stretch the fabric around the frame. Secure it tightly, ensuring that 6" [150] of fabric is in the trench. Overlap the fabric on one side of the inlet so that the fabric ends are not attached to the same post. Backfill and compact the excavated soil tightly onto the fabric. Place a vertical 2"x4" [50x100] in the center of the inlet so that the top is at the top of the fence and the bottom is at least 6" [150] below the bottom of the ditch.

PAYMENT:

The Department will pay for accepted quantities at the prices shown in Appendix F of Supplemental Specification 832 (SS832) for the following items:

- Inlet Protection

All items shown on this Standard Construction Drawing that are required for construction that are not specifically identified in SS832 Appendix F are considered incidental.

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4-29-02
7-19-02
12-01-08
4-17-09

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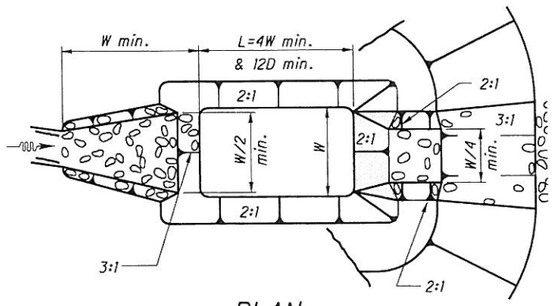
STANDARD HYDRAULIC CONSTRUCTION DRAWING

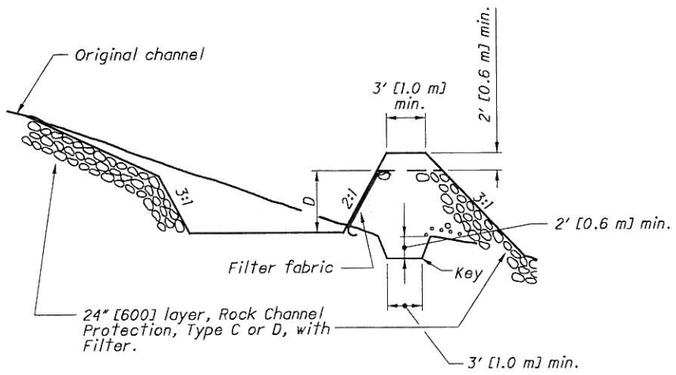
CONSTRUCTION EROSION CONTROL

SCD NUMBER DM-4.4

2 / 2



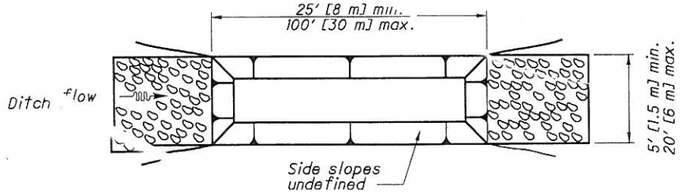
PLAN



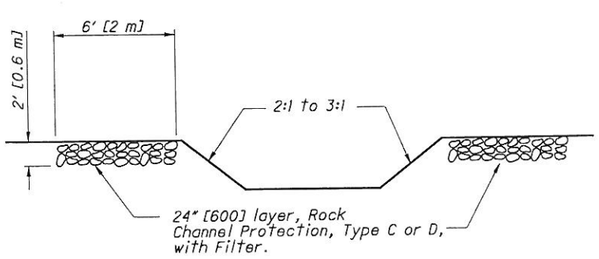
PROFILE

SEDIMENT DAM

(Drainage Area of Less than 5 Acres)



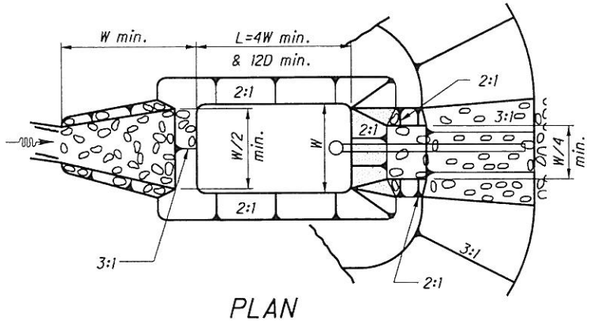
PLAN



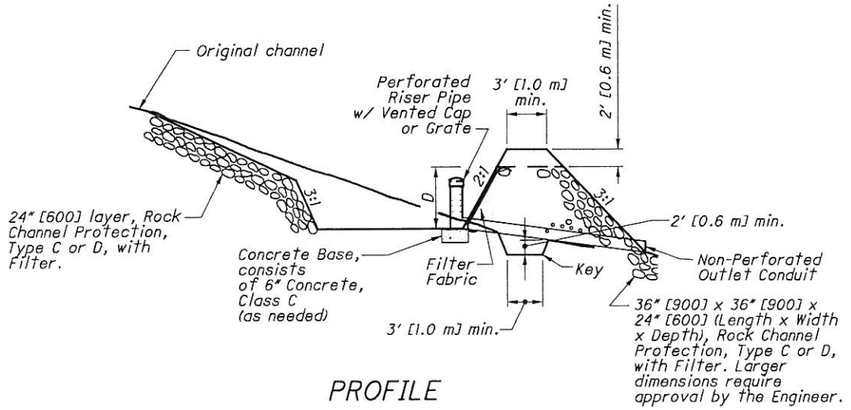
PROFILE

SEDIMENT BASIN

(Drainage Area of Less than 5 Acres)



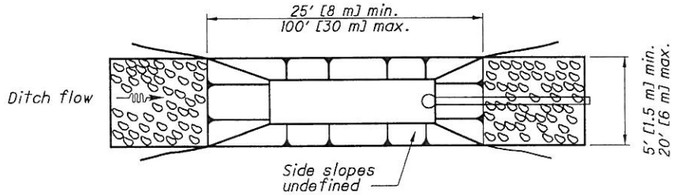
PLAN



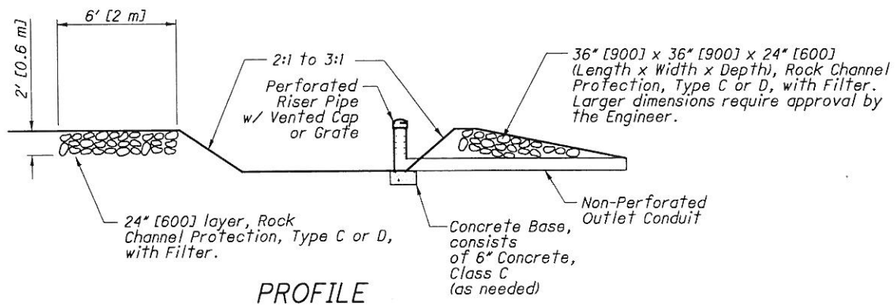
PROFILE

SEDIMENT DAM

(Drainage Area of 5 Acres or More)



PLAN



PROFILE

SEDIMENT BASIN

(Drainage Area of 5 Acres or More)

NOTES

MATERIAL:

Furnish materials conforming to Item 203, Embankment and Item 601, Rock Channel Protection, Type C or D with filter. Furnish construction fence consisting of 4'-0" [1.3 m] high plastic fence with 6' [2 m] long metal fence posts.

CONSTRUCTION:

Construct the Basin and Dams as detailed. Construct the construction fence in urban areas or in high pedestrian traffic areas. Construct the fence to completely surround the sediment basin or dam. Place the fence post on 8' [2.6 m] centers, 2' [0.6 m] deep. Securely attach the plastic construction fence to the fence post.

PAYMENT:

The Department will pay for accepted quantities at the prices shown in Appendix F of Supplemental Specification 832 (SS832) for the following items:

- Sediment Basins and Dams
- Rock Channel Protection, Type C or D, with Filter

All items shown on this Standard Construction Drawing that are required for construction that are not specifically identified in SS832 Appendix F are considered incidental.

RISER PIPE:

Use schedule 40 Polyvinyl Chloride Conduit.

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4-29-99
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4-17-09

ROADWAY HYDRAULIC ENGINEER
J. Stains

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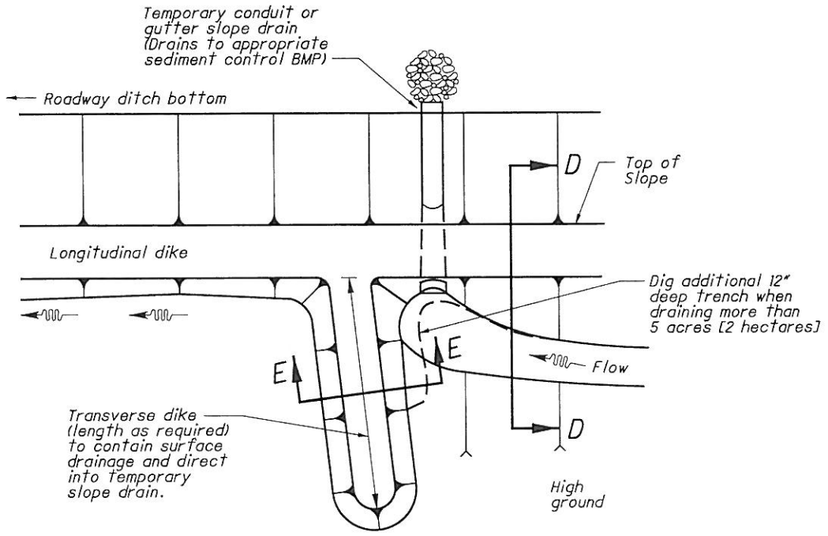
STANDARD HYDRAULIC CONSTRUCTION DRAWING

SEDIMENT AND EROSION CONTROLS

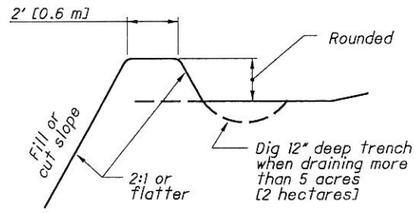
SCD NUMBER
DM-4.3

1 / 2

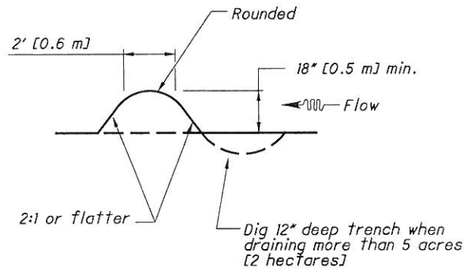
DIKES AND SLOPE DRAINS



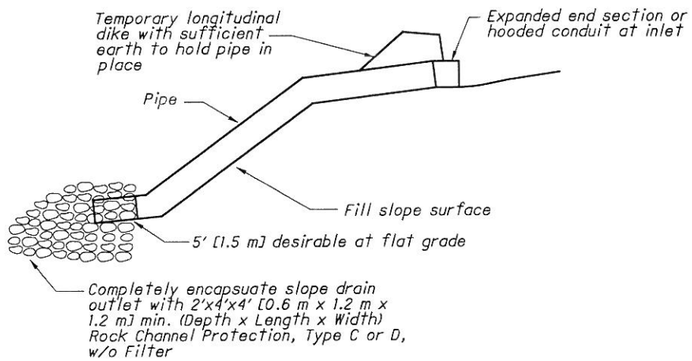
PLAN VIEW



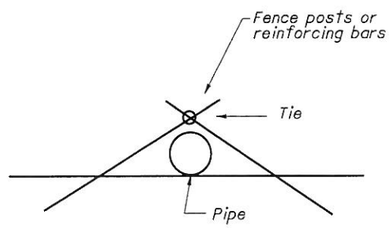
SECTION D-D



SECTION E-E



CONDUIT SLOPE DRAIN



TIE-DOWN SLOPE DRAIN

NOTES

MATERIAL:

Furnish materials conforming to Item 203, Embankment and Item 601, Rock Channel Protection, Type C or D, without filter.

Furnish the following for the slope drains: corrugated steel pipe, corrugated or smooth plastic pipe, reinforcing bars or fence posts.

CONSTRUCTION:

Construct as detailed. Compact the dike to 85% of Standard Proctor.

Use reinforcing bars or fence posts to tie down the slope drains and to keep the pipe from moving.

Ensure that the water entering the slope drain inlet does not erode or degrade the dike section containing the temporary conduit.

PAYMENT:

The Department will pay for accepted quantities at the prices shown in Appendix F of Supplemental Specification 832 (SS832) for the following items:

- *Slope Drains*
- *Dikes*
- *Rock Channel Protection, Type C or D, without Filter*

All items shown on this Standard Construction Drawing that are required for construction that are not specifically identified in SS832 Appendix F are considered incidental.

TEMPORARY SLOPE DRAINS RECOMMENDED SIZES		
AREA in acres [hectares]	PIPE SIZES	
	Smooth	Corrugated
0-4 [0-1.6]	6" [150]	6" [150]
4-8 [1.6-3.2]	8" [200]	12" [300]
8-12 [3.2-4.9]	10" [250]	15" [375]

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4-29-99
7-19-02
11-26-08
4-17-09

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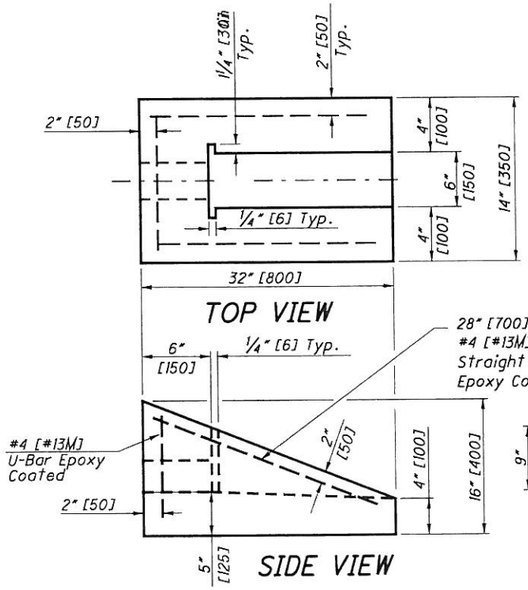
STANDARD HYDRAULIC CONSTRUCTION DRAWING

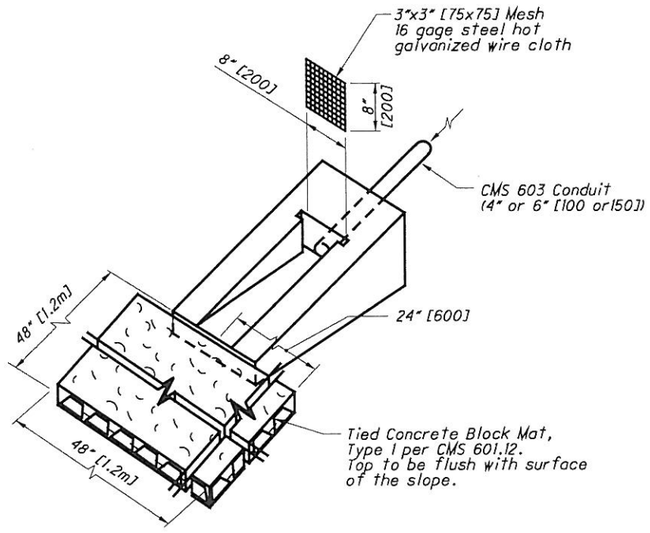
SEDIMENT AND EROSION CONTROLS

SCD NUMBER DM-4.3

2 / 2

CONSTRUCTION METHODS





NOTES

MASONRY COLLARS: *A masonry collar shall be provided where plans require that a pipe extension be joined to the end of an existing pipe with a butt joint. The cost shall be included in the unit price bid for the new conduit.*

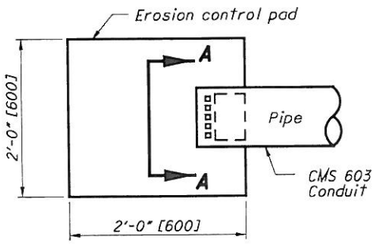
EROSION CONTROL PAD AND ANIMAL GUARDS: *These items shall be provided at the outlet end of all farm drains except where they outlet into a drainage structure. The steel bolts or rods for the animal guard shall be galvanized per CMS 710.06. In lieu of drilling or punching the ½" [13] diameter holes into the pipe, a metal collar meeting all of the above requirements may be clamped onto the pipe if approved by the Engineer.*

PAYMENT: *Erosion control pads, masonry collars, and animal guards shall be included in the unit price bid for* ***Item 603 - __ inch [mm] Conduit, Type __ .***

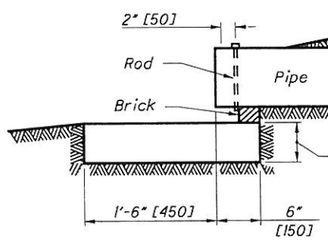
PRECAST REINFORCED CONCRETE OUTLET: *The concrete outlet shall meet the requirements of CMS 604.*

PAYMENT: *The precast reinforced concrete outlet shall be paid at the contract unit price bid for* ***Item 604 - Precast Reinforced Concrete Outlet.*** *The Mortar; Tied Concrete Block Mat, Type I, and Wire Mesh shall be included in the unit price bid for* ***Item 601 - Tied Concrete Block Mat, Type I.***

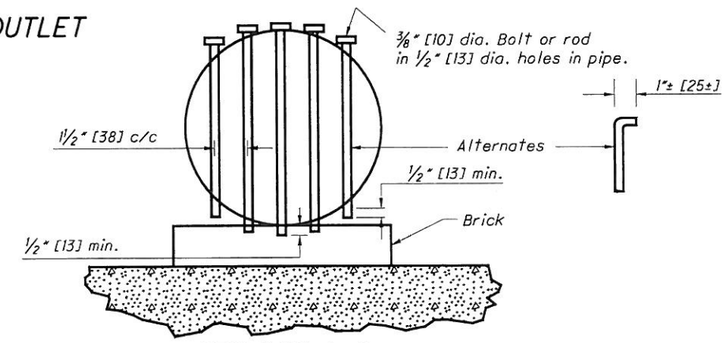
PRECAST REINFORCED CONCRETE OUTLET



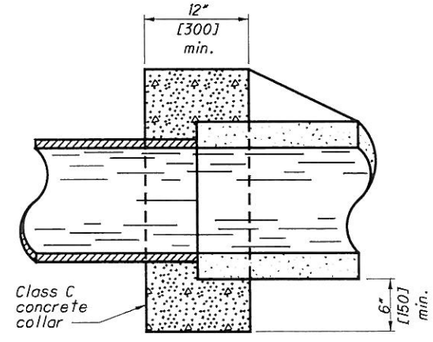
PLAN



PROFILE



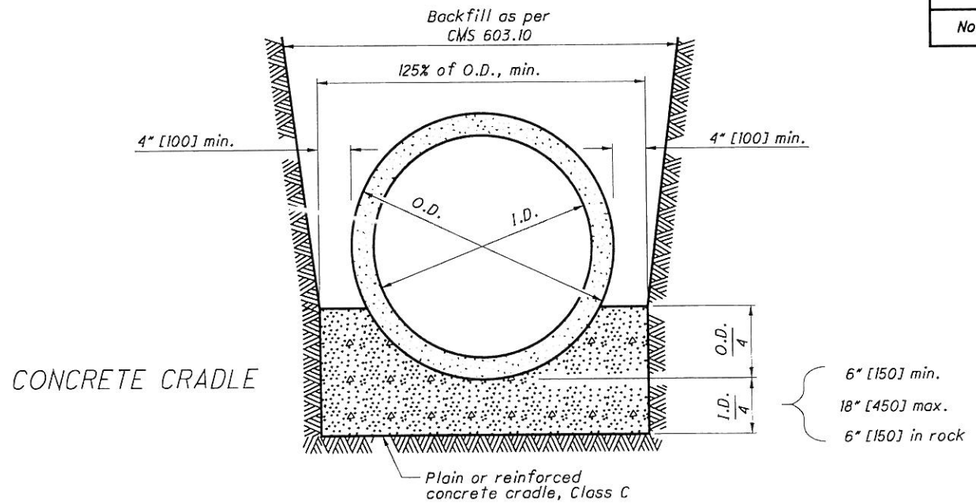
SECTION A-A



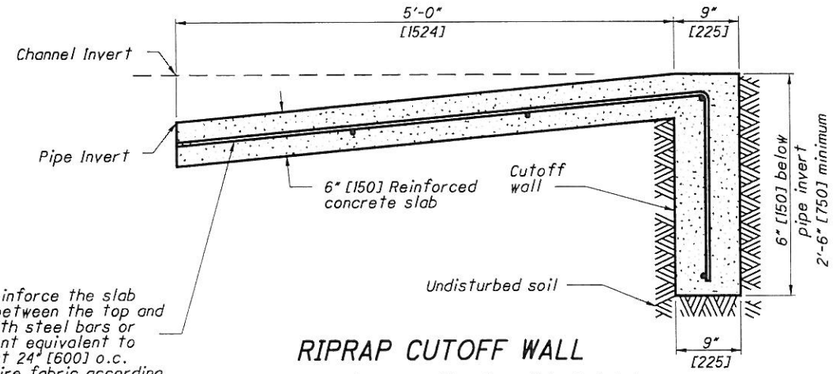
MASONRY COLLAR

EROSION CONTROL PAD AND ANIMAL GUARD FOR OUTLET PIPE

CONDUIT SIZE	4" [100]	6" [150]	8" [200]	10" [250]	12" [300]	15" [375]	18" [450]
No. of Bolts	2	3	5	6	7	9	11



CONCRETE CRADLE



RIPRAP CUTOFF WALL

As per CMS 601.04.D, reinforce the slab approximately midway between the top and bottom of the slab, with steel bars or fabricated reinforcement equivalent to #3 [#10M] round bars, at 24" [600] o.c. in two directions, or wire fabric according to SCD BP-1.1.

The cost of the cutoff wall shall be included in the unit price bid for Item 601 Riprap using 6" [150] reinforced concrete slab.

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7-20-01
7-19-02
7-18-03
1-21-05
10-21-05
4-21-06

ROADWAY HYDRAULIC ENGINEER: J. Stains

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STANDARD HYDRAULIC CONSTRUCTION DRAWING

OUTLETS, DRAINS AND SEWERS

SCD NUMBER DM-1.1

1 / 2

24 / 38

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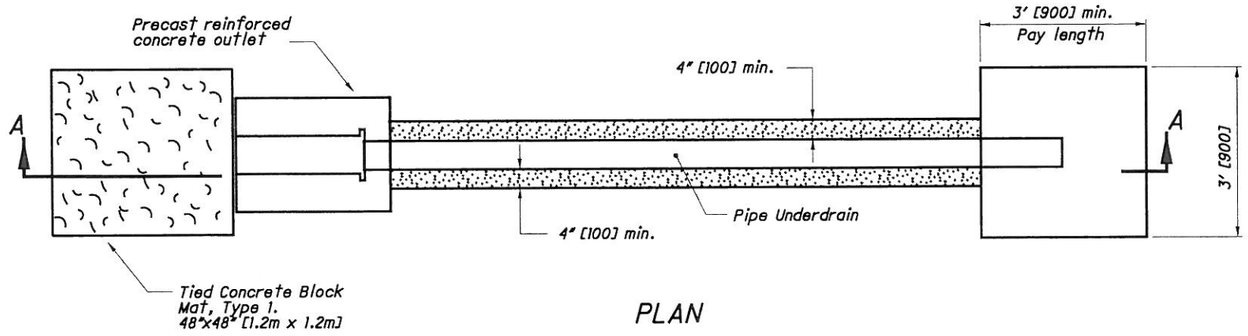
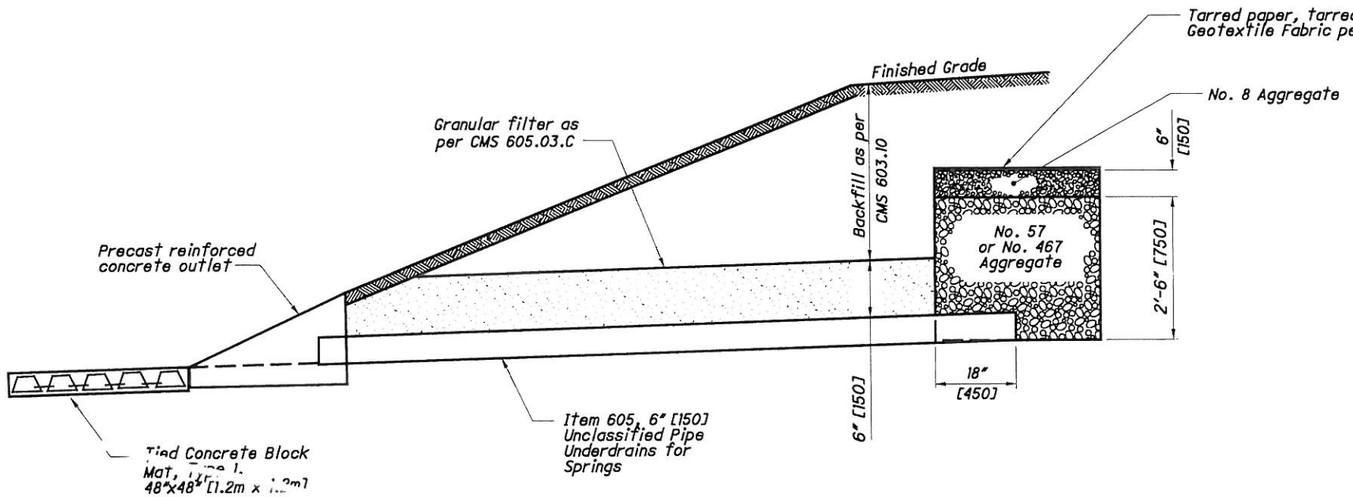


PLAN



SECTION A-A
SPRING DRAIN DETAIL

NOTES

SPRING DRAIN: *Aggregates, tarred paper, tarred burlap, or geotextile fabric backfill and necessary excavation for spring drains shall be included for payment in the unit price bid per Foot [Meter] for* ***Item 605, Aggregate Drains for Springs.***

PAYMENT: *The pipe shall be included in the unit price bid per Foot [Meter] for* ***Item 605 - 6" [150] Unclassified Pipe Underdrains for Springs.***

PRECAST REINFORCED CONCRETE OUTLET: *The concrete outlet shall meet the requirements of CMS 604.*

PAYMENT: *The precast reinforced concrete outlet shall be paid at the contract unit price bid for* ***Item 604 - Precast Reinforced Concrete Outlet.***

The Mortar, Tied Concrete Block Mat, Type 1, and Wire Mesh shall be included in the unit price bid for ***Item 601, Tied Concrete Block Mat, Type 1.***

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7-20-01
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7-18-03
1-21-05
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4-21-06

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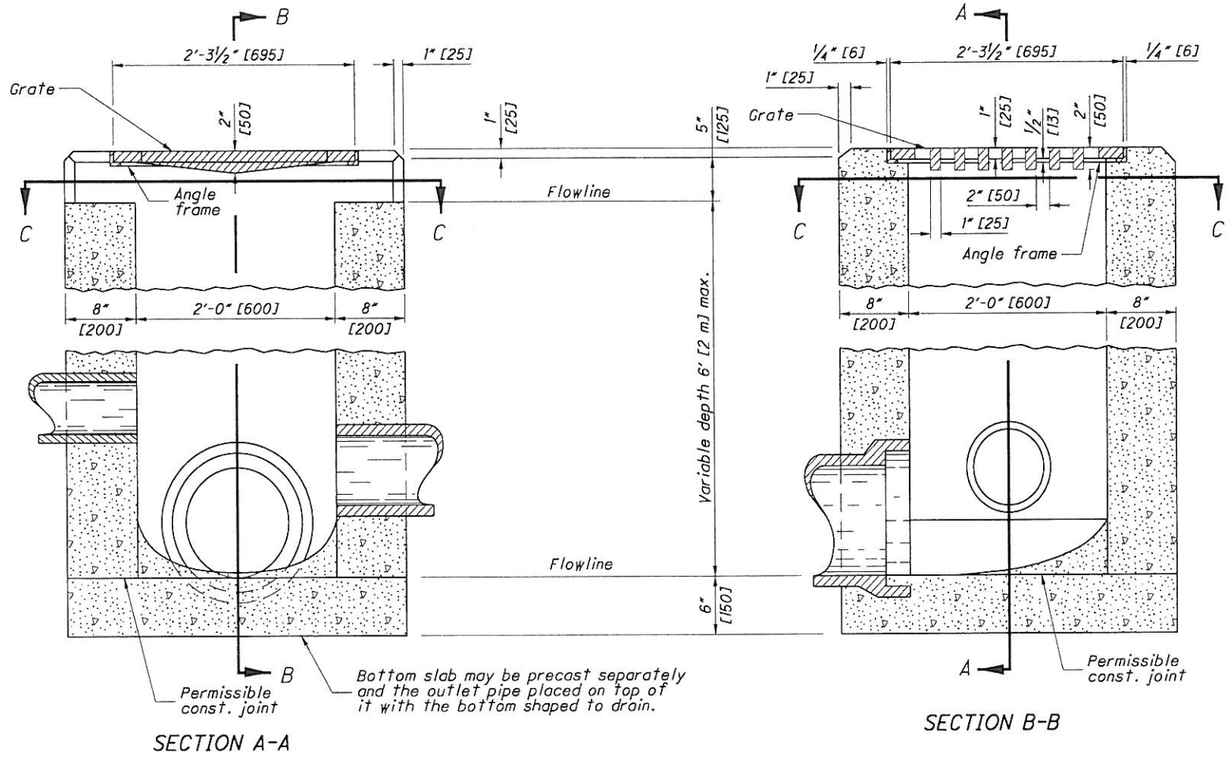
STANDARD HYDRAULIC CONSTRUCTION DRAWING

OUTLETS, DRAINS AND SEWERS

SCD NUMBER DM-1.1

2 / 2

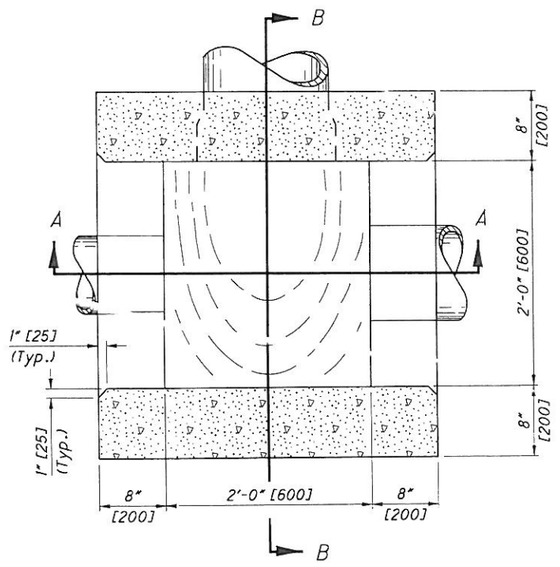
25 / 38



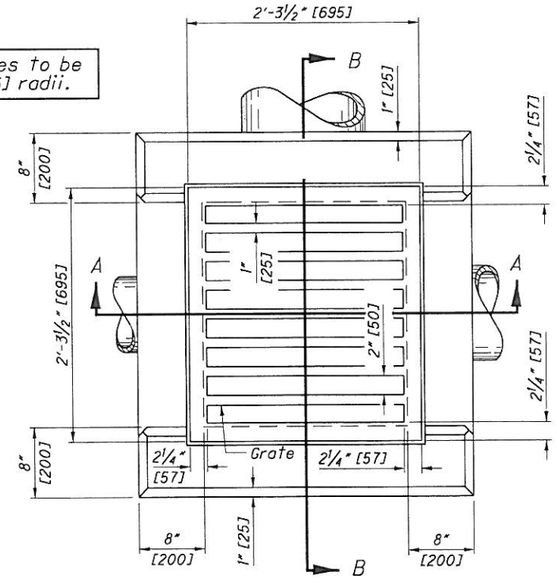
SECTION A-A

SECTION B-B

All grate edges to be rounded ¼" [6] radii.



SECTION C-C



PLAN

NOTES

GENERAL: *Catch Basins 2-2A and 2-2B are not intended for traffic bearing applications.*

CATCHBASINS 2-2A &B: *This sheet depicts Catch Basin 2-2A. See Sheet 2 of 2 for Catch Basin 2-2B.*

GRATE AND FRAME: *The design shall be essentially the same and equally as strong as the one shown (see Construction Information table), or meet the requirements of CMS 711.14. Grate openings and dimensions shall not differ from those shown here unless otherwise shown in the plans.*

As of January 1, 2003, the following text shall be cast into the top of the grate:

"DUMP NO WASTE" and "DRAINS TO WATERWAY"

Text shall be printed in bold, capital letters with a minimum height of ½". "WATERWAY" may be substituted with "STREAM", "RIVER", "LAKE", etc. Actual placement and logo may vary per manufacturer.

WALLS: *Brick or cast-in-place walls have a nominal thickness of 8" [200]. Precast walls shall have a minimum thickness of 6" [150] and be reinforced sufficiently to permit shipping and handling without damage. Brick shall not be used above the flow line of the side opening for Type 2-2A.*

CONCRETE: *Cast-in-place concrete is to be Class C. All precast concrete shall meet the requirements of CMS 706.13 and marked with the catch basin number.*

PRECAST BASE: *If a precast base is used, it shall be set deep enough so that the top can be placed on the base to provide the grate elevation specified in the plans. Layers of brick shall not be used to adjust the top elevation.*

LOCATION AND ELEVATION: *When given on the plans, location is the top center of the grate and the elevation is the flow line of the side inlet.*

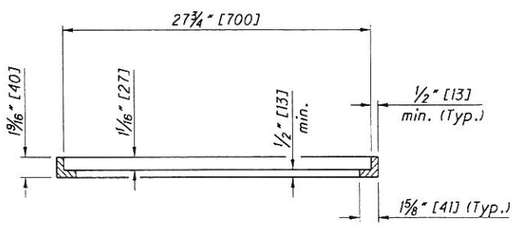
MINIMUM DEPTH: *The minimum depth of CB No. 2-2A shall be the outside diameter (O.D.) of the outlet pipe plus 7" [175].*

OPENINGS: *Any pipe openings greater than 4" [100] from the outside of the pipe to the structure require the Engineer's approval. Fill any voids per CMS 604.*

2-2A SIDE INLETS: *Inlets shall be provided on both sides of the No. 2-2A catch basin in sags and on upstream side only where the ditch has a continuous down grade past the catch basin. CB 2-2A's shall not be used within the Clear Zone. The flow line should be 4" to 6" [100 to 150] below normal ditch returning to normal 10' to 15' [3 m to 5 m] each side of the inlet.*

PAYMENT: *All materials and labor, including excavation and backfilling, shall be paid for under* ***Item 604 - Catch Basin, No. 2-2A.***

CONSTRUCTION INFORMATION
Minimum weight [mass] of grate, 120 lbs. [54 kg]
Minimum weight [mass] of frame, 40 lbs. [18 kg]



SECTION THRU ANGLE FRAME FOR STANDARD No. 2-2A CATCH BASIN

CATCH BASIN No. 2-2A

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7-20-01
7-19-02
7-15-05

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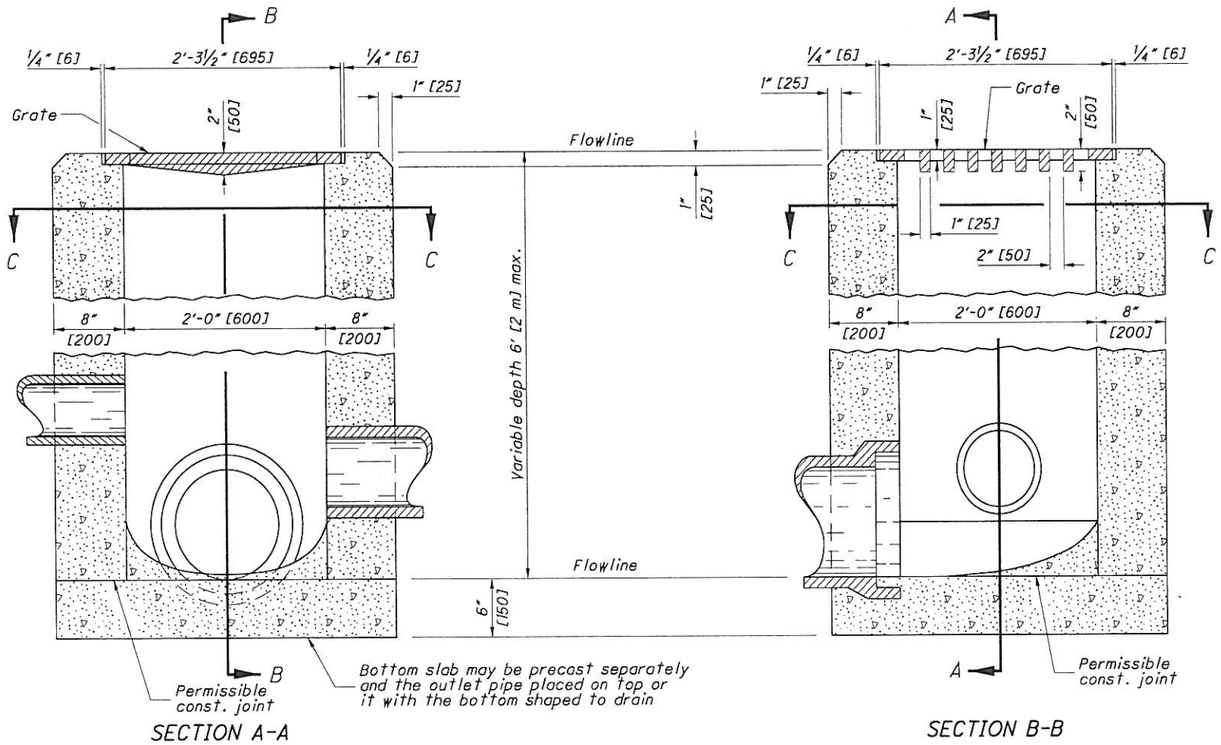
STANDARD HYDRAULIC CONSTRUCTION DRAWING

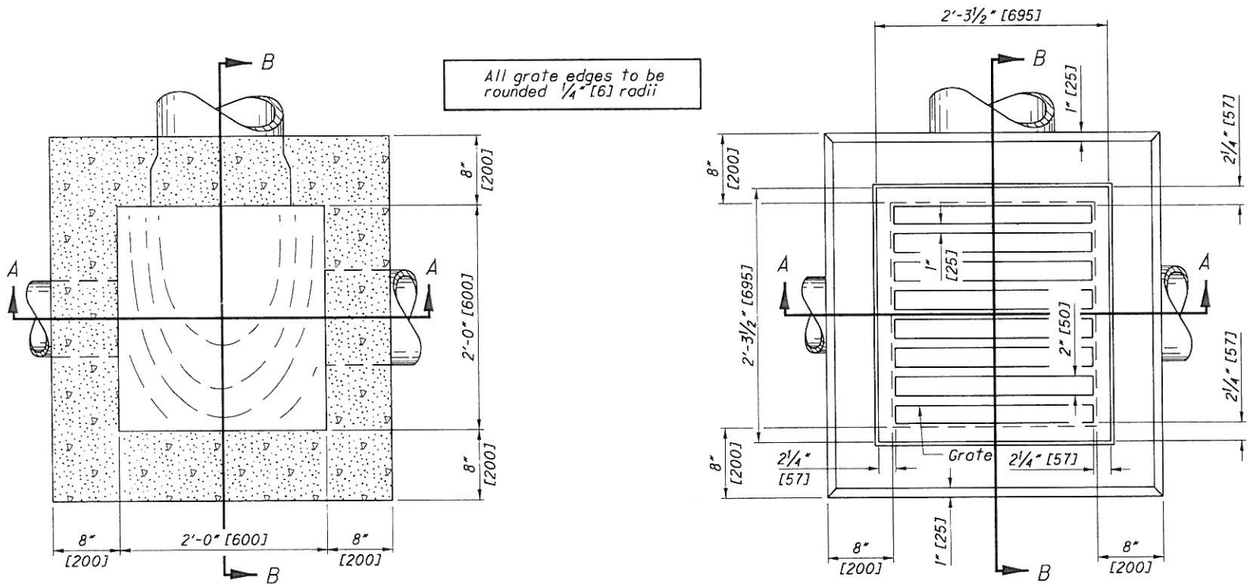
CATCH BASINS No's 2-2A & B

SCD NUMBER CB-1.1

1 / 2

26
38





CATCH BASIN No. 2-2B

NOTES

CATCH BASINS 2-2A & B: *This sheet depicts Catch Basin 2-2B. See Sheet 1 of 2 for Catch Basin 2-2A.*

GRATE: *The design shall be essentially the same and equally as strong as the one shown (see Construction Information table), or meet the requirements of CMS 711.14. Grate openings and dimensions shall not differ from those shown here unless otherwise shown in the plans.*

If necessary, bicycle safe grates shall be specified in the plans. Bicycle safe grates shall be Neenah No. R-4859-C or East Jordan No. 5110 Type M3 or approved equals.

As of January 1, 2003, the following text shall be cast into the top of the grate:

"DRAINS TO WATERWAY" *and* ***"DUMP NO WASTE"***

Text shall be printed in bold, capital letters with a minimum height of 1/2". "WATERWAY" may be substituted with "STREAM", "RIVER", "LAKE", etc. Actual placement and logo may vary per manufacturer.

WALLS: *Brick or cast-in-place walls have a nominal thickness of 8" [200]. Precast walls shall have a minimum thickness of 6" [150] and be reinforced sufficiently to permit shipping and handling without damage.*

CONCRETE: *Cast-in-place concrete is to be Class C. All precast concrete shall meet the requirements of CMS 706.13 and marked with the catch basin number.*

PRECAST BASE: *If a precast base is used, it shall be set deep enough so that the top can be placed on the base to provide the grate elevation specified in the plans. Layers of brick shall not be used to adjust the top elevation.*

LOCATION AND ELEVATION: *When given on the plans, location and elevation are at the top center of the grate. When side openings are provided, the elevation shall be at the flow line of the side inlet.*

MINIMUM DEPTH: *The minimum depth of CB No. 2-2B shall be the outside diameter (O.D.) of the outlet pipe plus 4" [100].*

2-2B GRATE ELEVATION: *Grate elevation is to be placed 4" to 6" [100 to 150] below normal ditch returning to normal 10' to 15' [3 m to 5 m] each side of inlet.*

OPENINGS: *Any pipe openings greater than 4" [100] from the outside of the pipe to the structure require the Engineer's approval. Fill all voids per CMS 604.*

PAYMENT: *All materials and labor, including excavation and backfilling, shall be paid for under* ***Item 604 - Catch Basin, No. 2-2B.***

CONSTRUCTION INFORMATION
Minimum weight [mass] of grate, 120 lbs. [54 kg]

CATCH BASIN	OUTLET PIPE SIZE
2-2A	12" to 21" [300 to 525]
2-2B	12" to 21" [300 to 525]

STATE OF OHIO DEPARTMENT OF TRANSPORTATION
STATE HYDRAULIC ENGINEER

REVISIONS
7-20-01
7-19-02
7-15-05

ROADWAY HYDRAULIC ENGINEER: J. Stains

ALL METRIC DIMENSIONS (IN BRACKETS [ ]) ARE IN MILLIMETERS UNLESS OTHERWISE NOTED.

OFFICE OF STRUCTURAL ENGINEERING

STANDARD HYDRAULIC CONSTRUCTION DRAWING

CATCH BASINS No's 2-2A & B

SCD NUMBER CB-1.1

2 / 2

27
38

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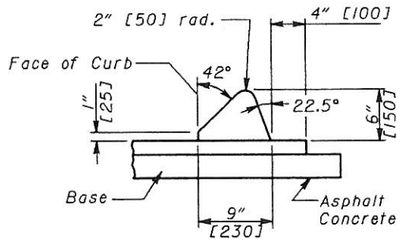

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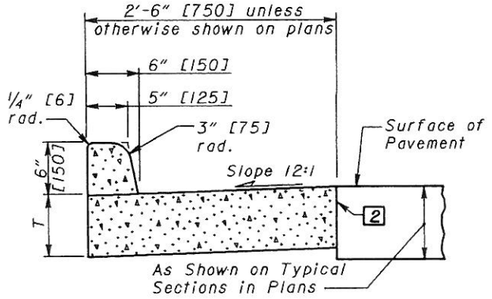

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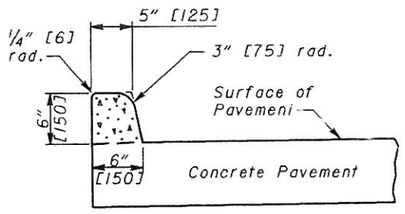

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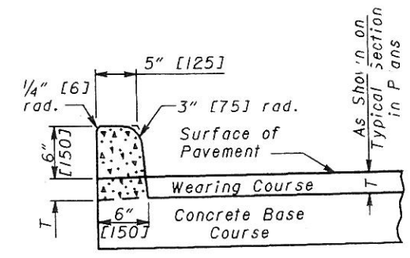

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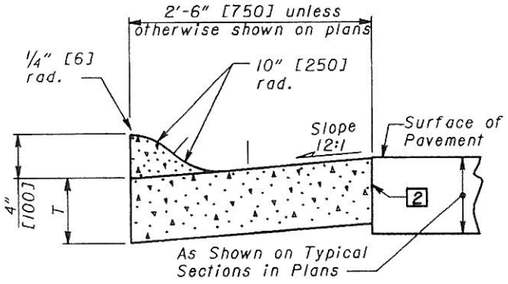

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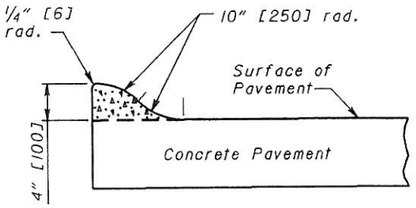
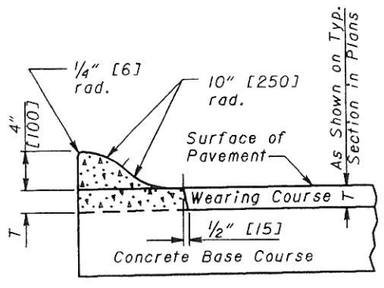


TYPE 3-A



TYPE 3-B

NOTES

GENERAL: This drawing shows alternate types of curb that may be used on various types of pavement. The typical section of the project shows the type to be used, also the thickness of the edge of the pavement or the edge of the curb and gutter section.

JOINTS: 1" [25] expansion joints shall extend up to the top of the curb and shall be constructed in the curb and gutter section in such a manner that the joint seal will extend the full width of the gutter and into the curb face a sufficient distance to seal the joint to an elevation of at least 2" [50] above the flow line of the gutter. Dowel bars shall be used in the curb and gutter section at expansion joints and to the surface fo the pavement.

Transverse expansion joint material shall meet the requirements of Item 705.03.

GUTTER PLATE THICKNESS: Thickness of gutter plate "T" shall be 9" [230] unless otherwise shown on the plans.

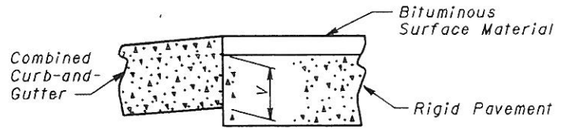
TOLERANCES: Dimensional tolerances are as follows:
Curbs: -1/32" to +1/4" [-1 to +5],
Gutters: 0 to +1/2" [0 to +12].

LEGEND

1 Expansion joint material and joint sealer are not required for the portion of the curb that is adjacent to a flexible pavement type. Both materials are required, as detailed, for the full height of rigid pavement and concrete bases.

2 Butt joints shall be provided between combined curb-and-gutter and new or existing rigid pavements, with tie bars or hook bolts provided at intervals of 5' [1.5 m]. See **SCD BP-2.1** for details of tie bars and hook bolts.

If the combined curb-and-gutter adjoins a new rigid base or an existing rigid base or pavement that is to be surfaced with bituminous material, a butt joint shall also be provided. However, tie bars or hook bolts shall be omitted when the vertical overlap ("V" in detail below) between the curb-and-gutter and rigid pavement is less than 7" [175].



THIS DRAWING REPLACES BP-5.1M DATED 10-28-94.

OHIO DEPARTMENT OF TRANSPORTATION
Paul L. Sullivan 5-28-00
ROADWAY DESIGN ENGINEER — DATE

REVISIONS

STDS. ENGR. M. Evans
DRAWN D. Focke

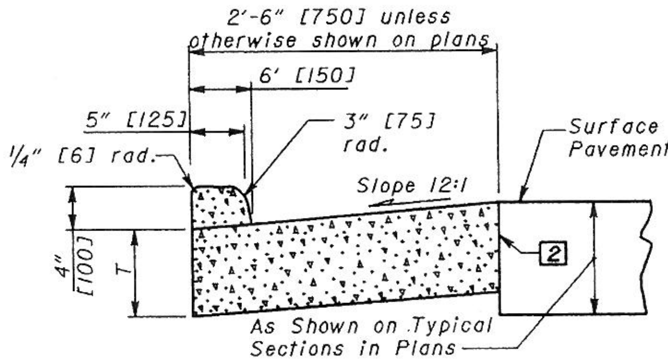
All metric dimensions (in brackets [ ]) are in millimeters unless otherwise noted.

ROADWAY ENGINEERING SERVICES

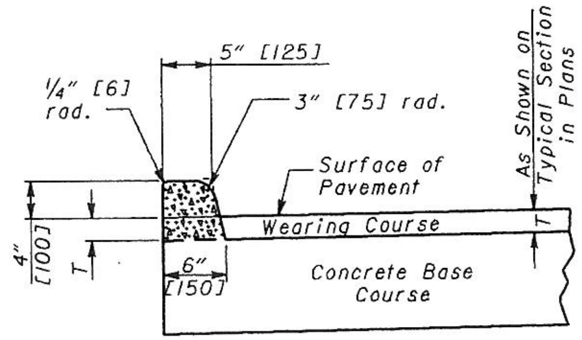
STANDARD ROADWAY CONSTRUCTION DRAWING
CONCRETE CURBS AND COMBINED CURB AND GUTTERS

NUMBER BP-5.1

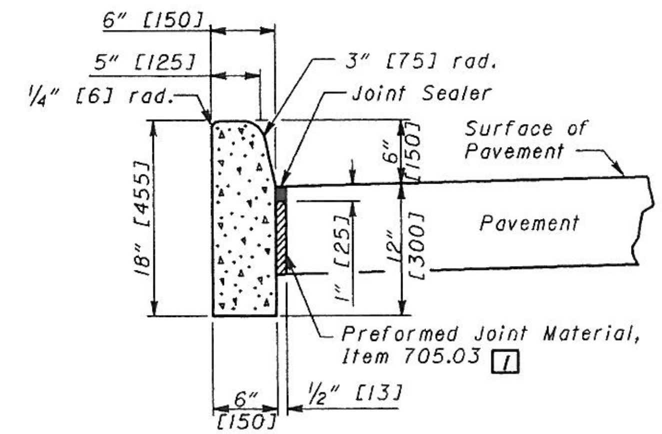
1 / 2



TYPE 4



TYPE 4-B



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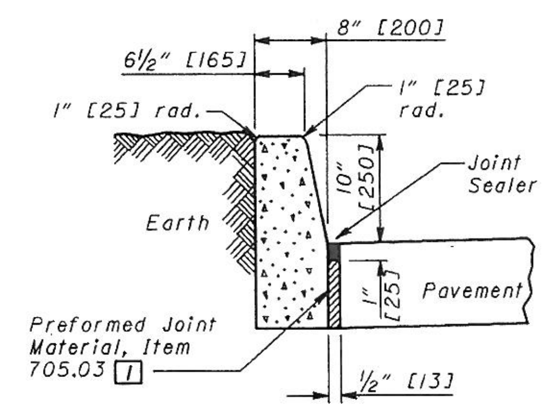

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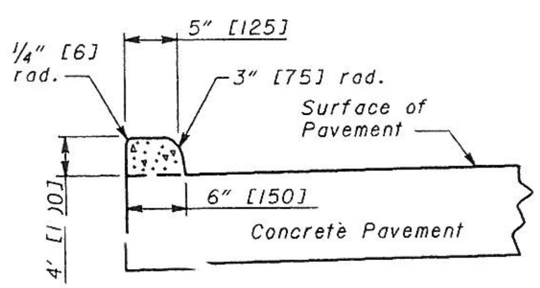
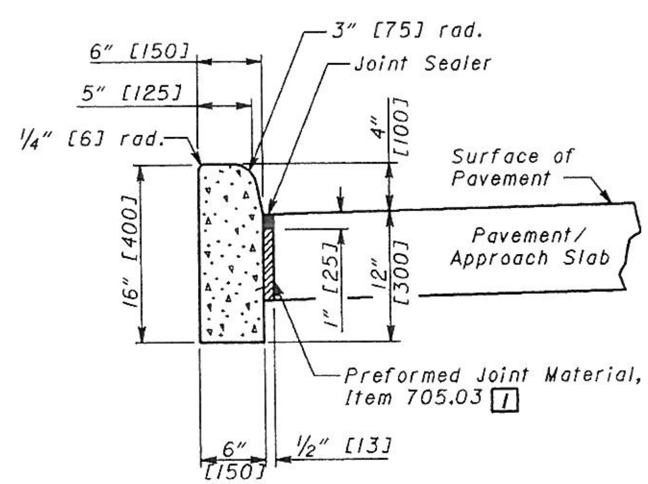
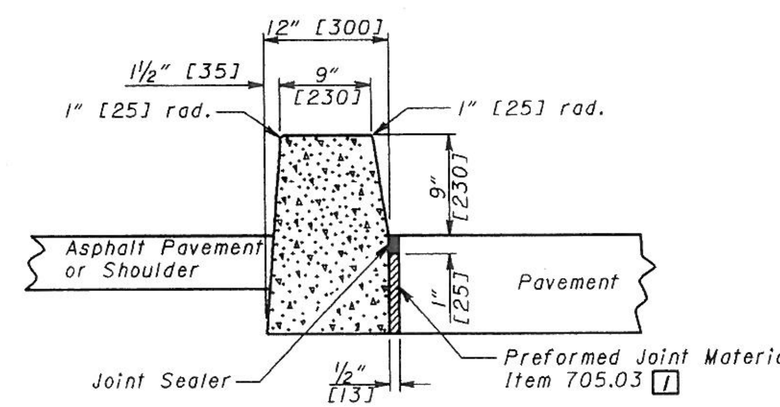


TYPE 4-A



TYPE 4-C



TYPE 8

See Sheet 1 of 2 for Notes and Legend.

THIS DRAWING REPLACES BP-5.1M DATED 10-28-94.

OHIO DEPARTMENT OF TRANSPORTATION
ROADWAY DESIGN ENGINEER
7-28-00
DATE

REVISIONS

STDS. ENGR. M. Evans
DRAWN D. Focke

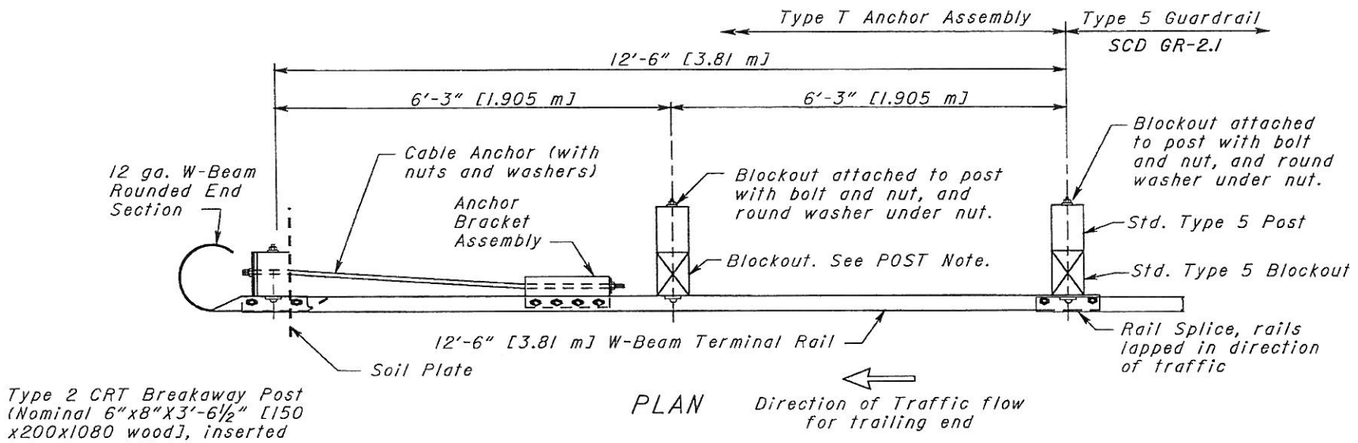
All metric dimensions (in brackets [ ]) are in millimeters unless otherwise noted.

ROADWAY ENGINEERING SERVICES

STANDARD ROADWAY CONSTRUCTION DRAWING

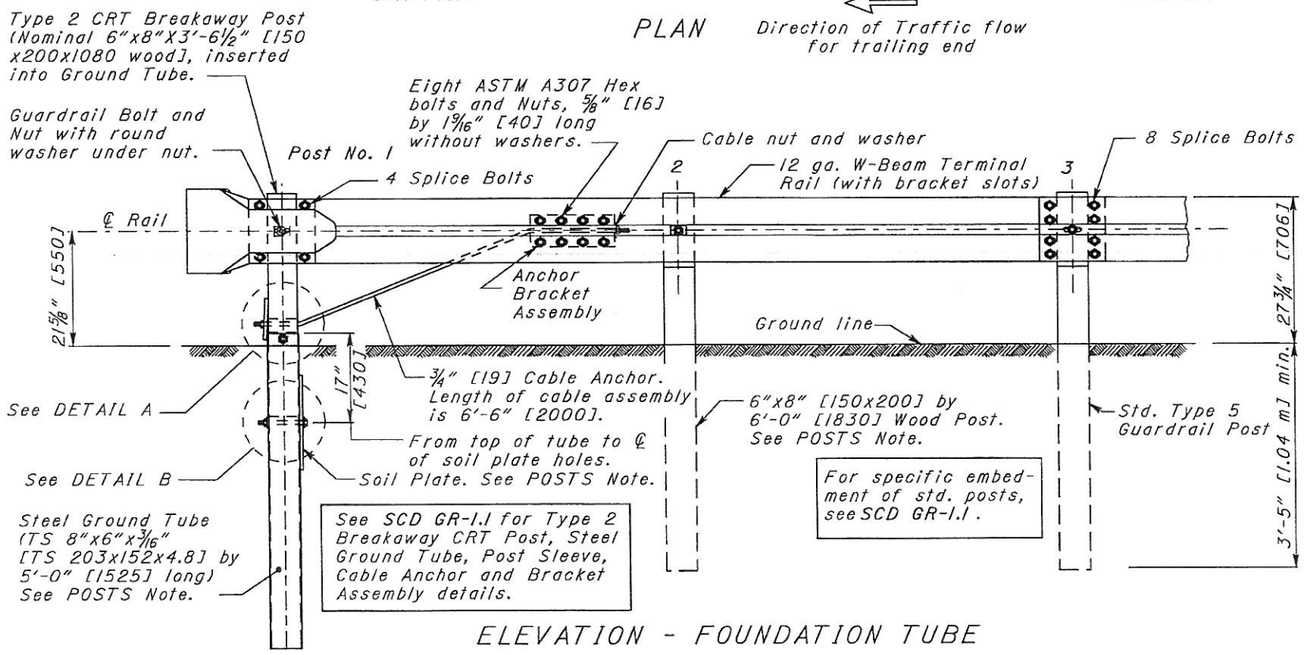
CONCRETE CURBS AND COMBINED CURB AND GUTTERS

NUMBER BP-5.1

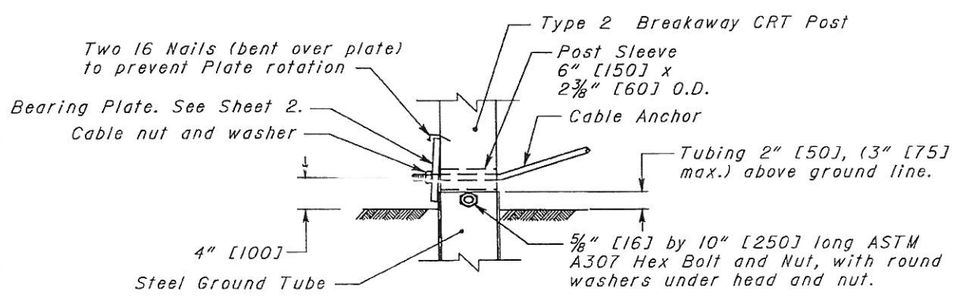


PLAN

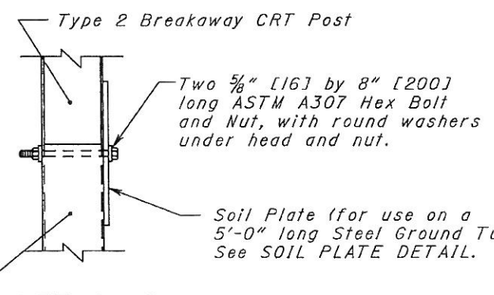
Direction of Traffic flow for trailing end



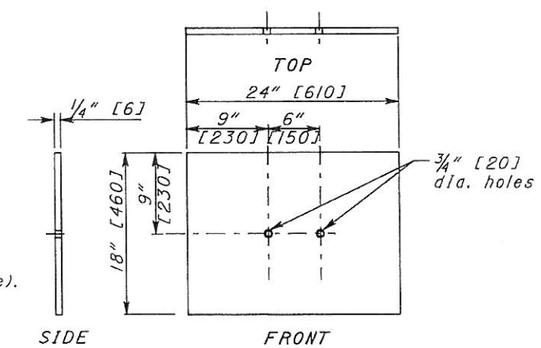
ELEVATION - FOUNDATION TUBE



DETAIL A



DETAIL B



SOIL PLATE DETAIL

NOTES

APPLICATION: Use Type T Anchor Assemblies on the trailing end of guardrail runs, located outside of the clear zone of opposing traffic. The assembly is 12'-6" [3.81] long, none of which can be considered the Length of Need for the guardrail run.

For termination requirements at driveways, see DRIVEWAY OPENING Detail on Sheet 2. For side road approaches and Terminals at Structures, see **Location & Design Manual, Volume 1, Figure 603-3.**

ANCHORING OPTIONS: Contractor may choose either the foundation tube (shown on this Sheet) or the concrete footing option (Sheet 2) to construct this anchor assembly.

If the foundation tube option is chosen, the contractor will take proper care to insure that the Soil Plate fasteners are not broken during the driving process.

Concrete footings may be cast-in-place or precast. Compact fill after placing precast unit.

MATERIALS: See SCD GR-1.1 for parts used on this anchor, including the CRT Breakaway Posts, Steel Ground Tube, Post Sleeve, Cable Anchor and Bracket Assembly.

Bearing Plate and Soil Plate is ASTM A709 Grade 36. Steel Ground Tube shall be ASTM A500, Grade B, and meet CMS 707.10. All angles, channels and plates shall meet CMS 711.01. All structural steel shall be galvanized as specified in CMS 711.02. All bolt washers indicated are standard galvanized steel of the appropriate size.

Concrete shall be class C.

Components on this anchor that are not detailed on SCD GR-1.1 include: 1) 12'-6" [3.81 m] W-Beam Terminal Rail (standard part RWM14a), and 2) W-Beam Rounded End Section (RWE03a). For complete details and specifications, see part descriptions in the **AASHTO/AGC/ARTBA Standardized Hardware Guide.**

POSTS: Post No. 1 may be an 8'-0" [2440] long Steel Ground Tube without a Soil Plate in lieu of the 5'-0" [1525] tube with Soil Plate.

Post No. 2 can be W6x9 [W150x13.9] (or W6x8.5 [W150x12.9]) with notched wood blockouts or a standard Type 5 post and blockout. Recycled plastic blockouts are permitted.

PAYMENT: All labor and materials, including the W-Beam Rounded End Section and the W-Beam Terminal Rail for the 12'-6" [3.81] anchor assembly shall be included in the unit price bid for **Item 606 - Anchor Assembly, Type T, Each.**

THIS DRAWING REPLACES GR-4.2 DATED 7-21-06.

OHIO DEPARTMENT OF TRANSPORTATION — 1-19-07
Dirk Gross — ROADWAY DESIGN ENGINEER — DATE

STDS. ENGR. D. Focke

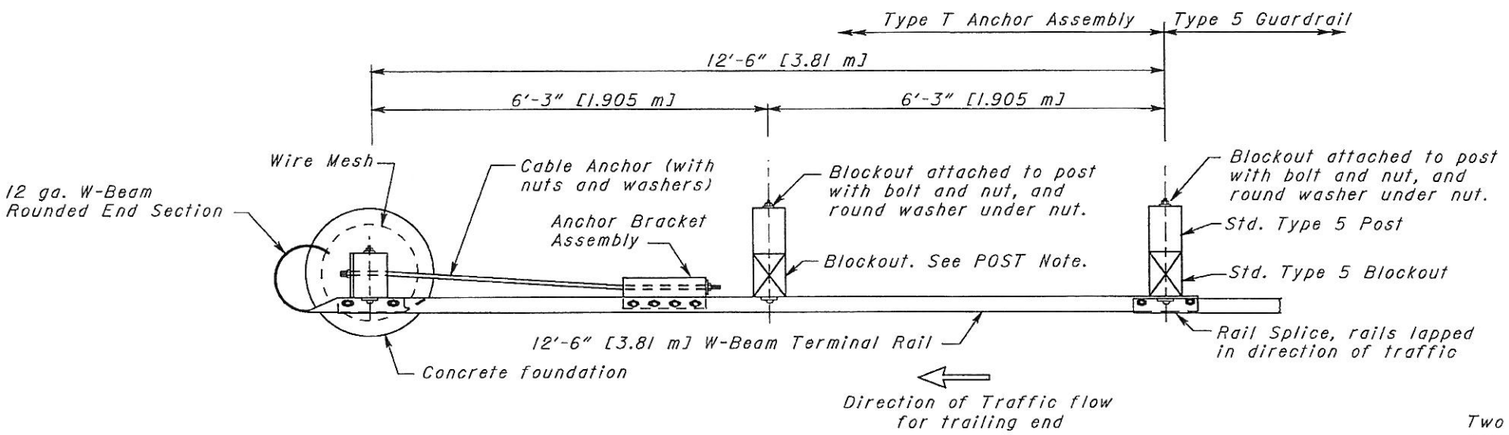
All metric dimensions (in brackets [ ]) are in millimeters unless otherwise noted.

ROADWAY ENGINEERING SERVICES

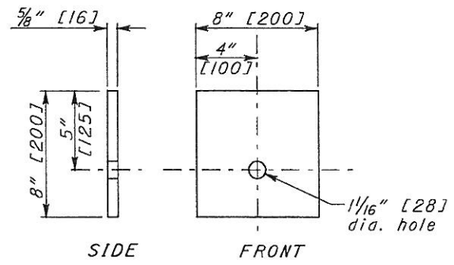
STANDARD ROADWAY CONSTRUCTION DRAWING
TYPE T ANCHOR ASSEMBLY
(Foundation Tube Option)

NUMBER GR-4.2

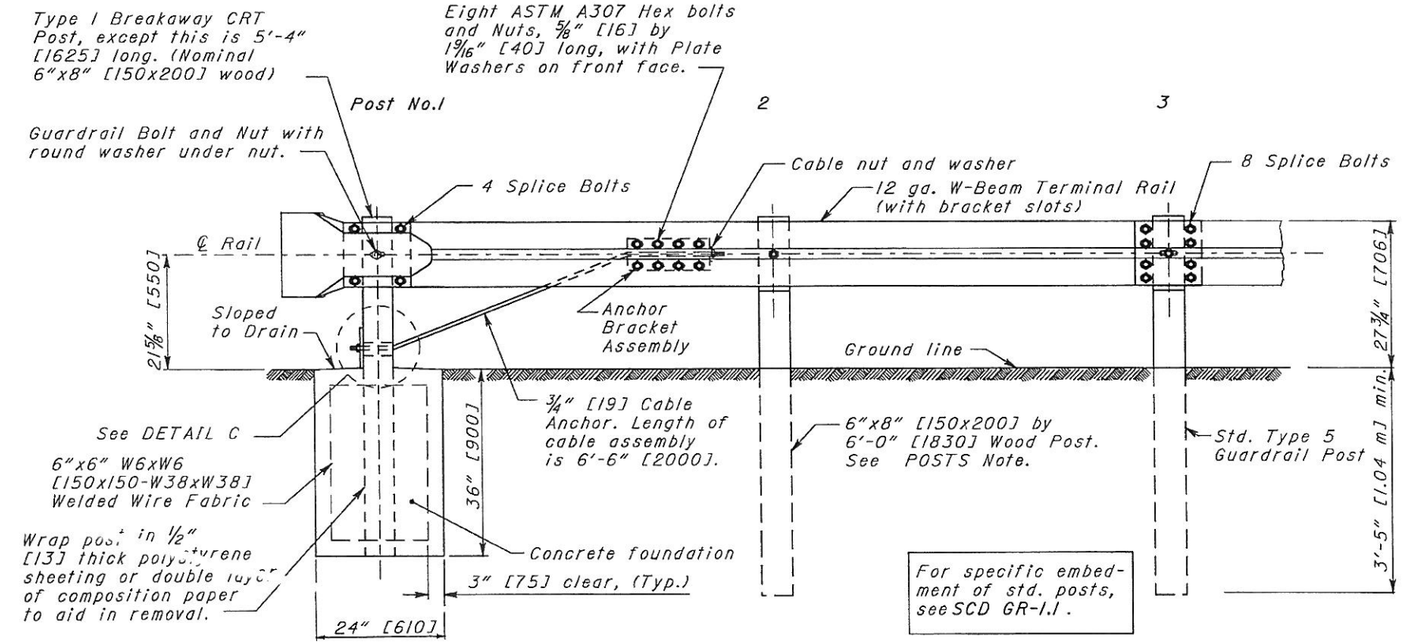
1 / 2



PLAN

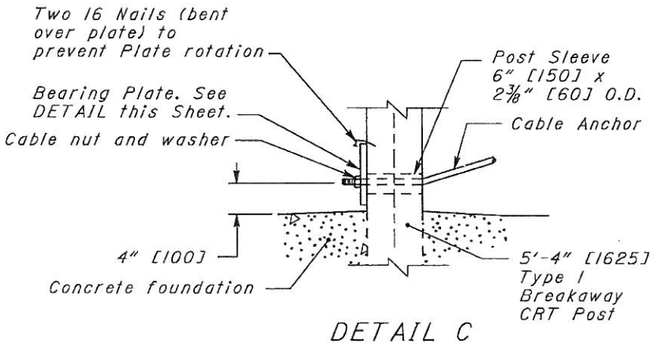


BEARING PLATE DETAIL

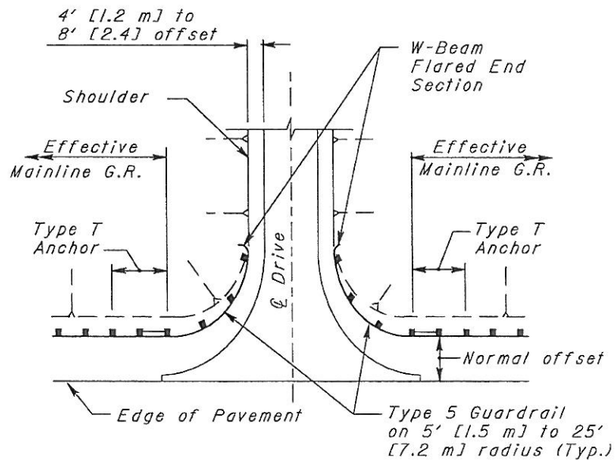


See SCD GR-1.1 for Type 1 Breakaway CRT Post, Steel Ground Tube, Post Sleeve, Cable Anchor and Bracket Assembly details.

ELEVATION - CONCRETE FOOTER



DETAIL C



DRIVEWAY OPENING

THIS DRAWING REPLACES GR-4.2 DATED 7-21-06.

OHIO DEPARTMENT OF TRANSPORTATION
Dick Graves
ROADWAY DESIGN ENGINEER
1-19-07
DATE

STDS. ENGR.
D. Focke

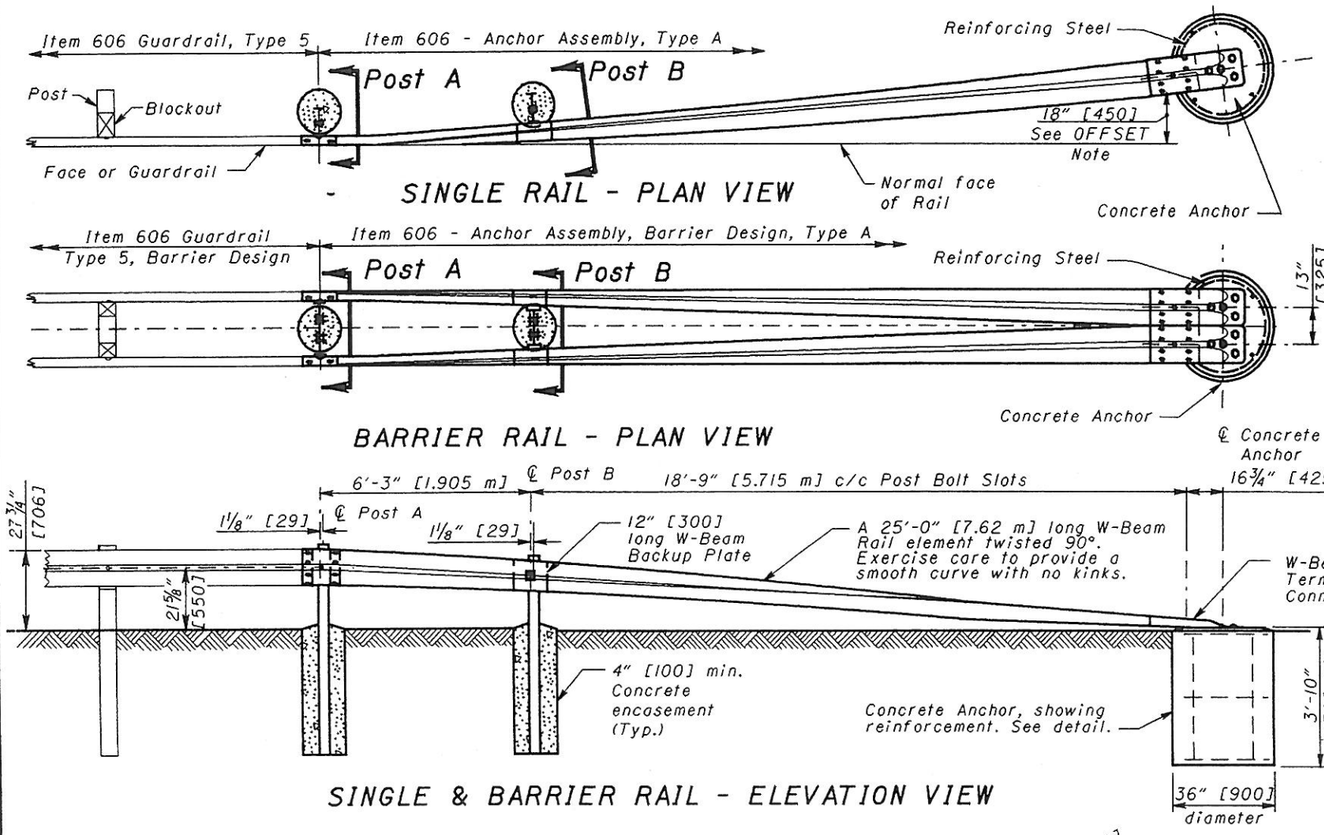
All metric dimensions (in brackets [ ]) are in millimeters unless otherwise noted.

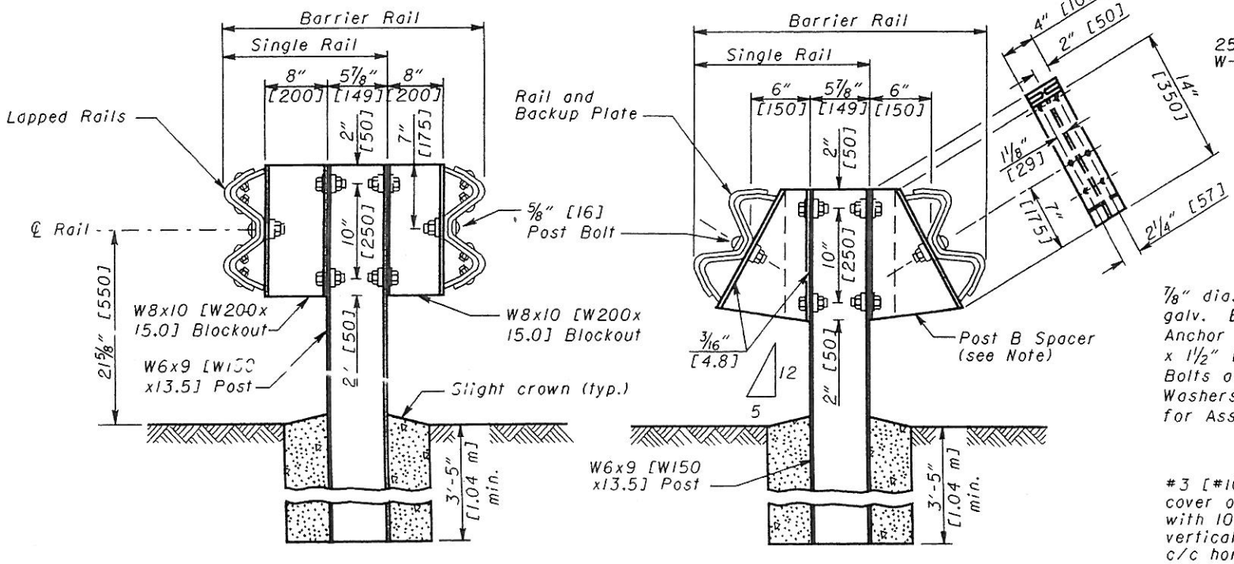
ROADWAY ENGINEERING SERVICES

STANDARD ROADWAY CONSTRUCTION DRAWING
TYPE T ANCHOR ASSEMBLY
(Concrete Footer Option)

NUMBER
GR-4.2

2 / 2





NOTES

APPLICATION: Use the Type A Anchor Assembly outside the clear zone on any roadway. On Non-NHS roadways it may be used in the clear zone, with restrictions. See **Location & Design Manual, Volume 1,** Section 603.

GENERAL: For details not shown, see **SCD GR-1.1** and other Drawings pertaining to specific guardrail type. Galvanize all steel parts.

OFFSETS: See **SCD GR-5.1** for Standard Guardrail Flare. The 18" [450] flare offset from normal face of rail, shown in the plan view (for single rail installations) will be utilized only where shoulder is insufficient for providing standard flares.

POSTS: Steel posts W6x9 [W150x13.5] are shown, but W6x8.5 [W150x12.6] posts are also permitted. See **SCD GR-1.1** for additional embedment details.

SPACERS: Post B Spacers shall be made of 3/16" [5] Steel Plate as specified in CMS 710.15 or two sections of W6x9 [W150x13.5] or W8x10 [W200x15.0] cut in the web (see dashed line on POST B Detail) and welded together on both sides.

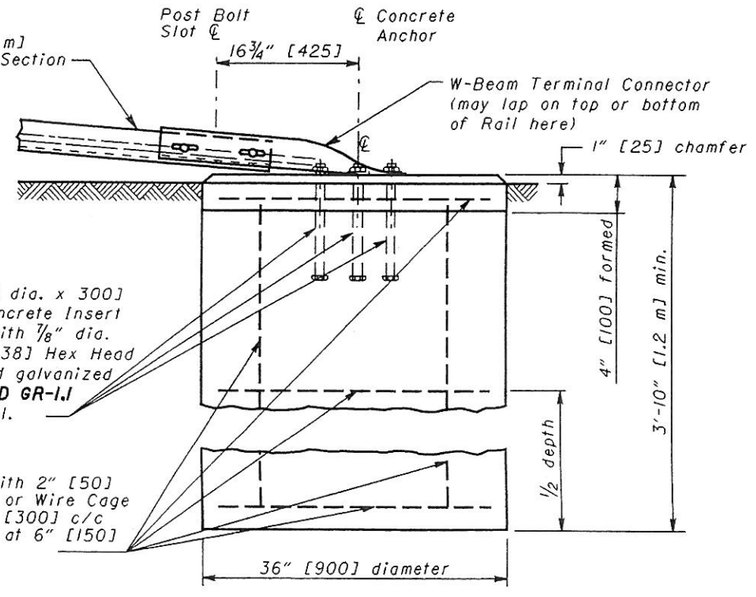
All steel spacers and posts may be provided with additional bolt holes so that these items will not be required to be made right and left handed.

Spacers shall be fastened to Posts with two 5/8" [16] hex head bolts and nuts with standard washers on both sides.

WASHERS: All washers indicated on this drawing are standard galvanized steel of the appropriate size.

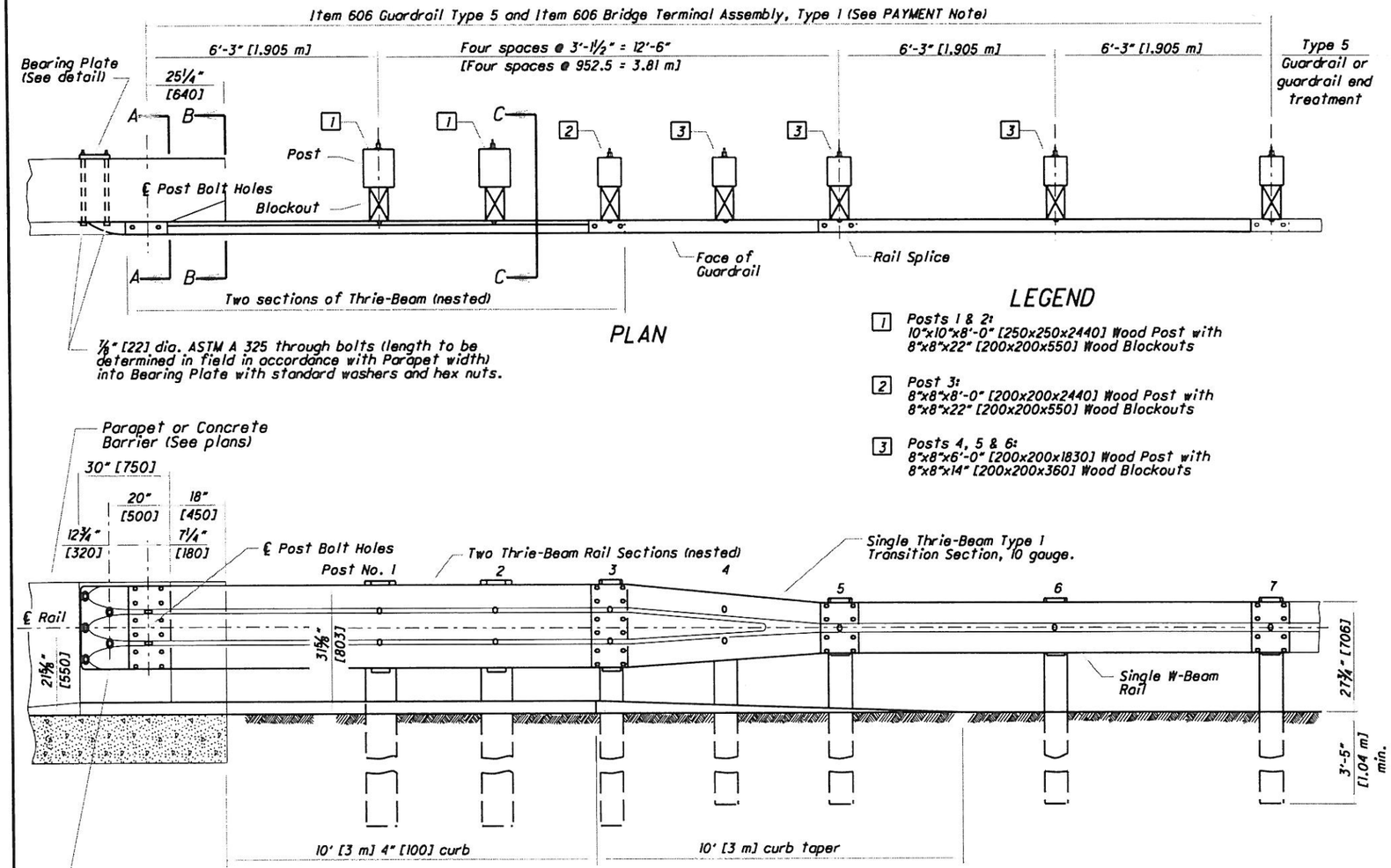
CONCRETE ANCHOR: Form top 4" [100] of anchor and slope the top to conform to slope of the adjacent ground. The 36" [900] diameter anchor may be replaced by a 2'-6" [750] square anchor at the contractor's option.

PAYMENT: Include all materials and labor for the 25'-0" [7.62 m] Single Rail, Type A Anchor Assembly in the unit price bid for **Item 606 - Anchor Assembly, Type A, Each.**
Pay for all materials and labor for the 25'-0" [7.62 m] Barrier Rail under the unit bid price **Item 606 - Anchor Assembly, Barrier Design, Type A, Each.**



THIS DRAWING REPLACES GR-4.1M DATED 11-30-94.

OHIO DEPARTMENT OF TRANSPORTATION — 4-18-03 DATE
ROADWAY DESIGN ENGINEER — Gary F. Strickland
STDS. ENGR. D. Focke
All metric dimensions are in millimeters unless otherwise noted.
ROADWAY ENGINEERING SERVICES
STANDARD ROADWAY CONSTRUCTION DRAWING
TYPE A ANCHOR ASSEMBLY
NUMBER GR-4.1
1 / 1

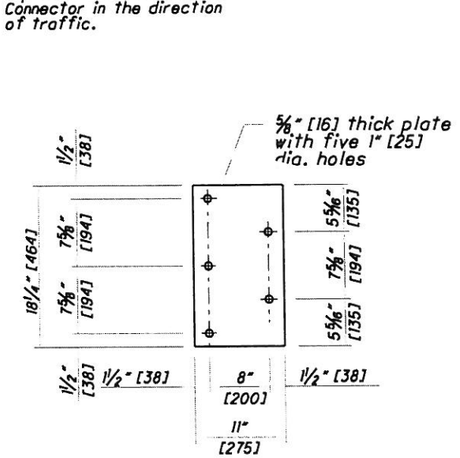


LEGEND

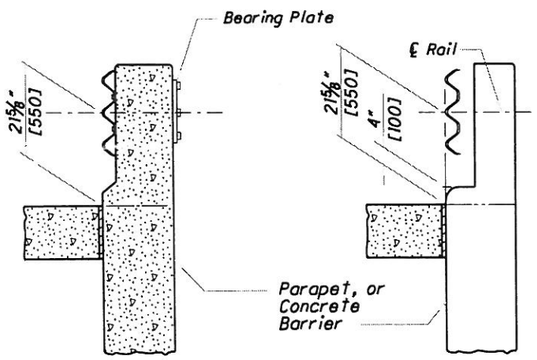
1 Posts 1 & 2:
10"x10"x8'-0" [250x250x2440] Wood Post with 8"x8"x22" [200x200x550] Wood Blockouts

2 Post 3:
8"x8"x8'-0" [200x200x2440] Wood Post with 8"x8"x22" [200x200x550] Wood Blockouts

3 Posts 4, 5 & 6:
8"x8"x6'-0" [200x200x1830] Wood Post with 8"x8"x14" [200x200x360] Wood Blockouts

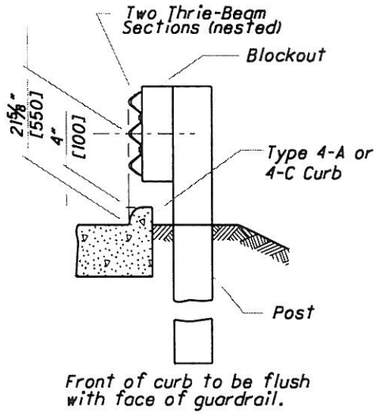


BEARING PLATE



SECTION A-A

SECTION B-B



SECTION C-C

NOTES

GENERAL: For additional details, see **SCD GR-1.1.**

APPLICATION: Use Type 1 Bridge Terminal Assembly to connect guardrail runs to bridges having deflector Parapet Type Bridge Railing (see **Structural Engineering's SCD BR-D.** It may also be used to connect guardrail runs to the approach ends of Concrete Barrier (see **SCD RM-4.6**).

On undivided, bi-directional roadways, Type 1's may be used to anchor guardrail runs to the trailing end of Deflector Parapets or Concrete Barrier installations.

THRIE BEAM TRANSITION: Symmetrical W-Beam to Thrie Beam transition panel shall be 10 gauge.

POSTS: Posts may be set in drilled holes or driven to grade. See **SCD GR-1.1** for additional Post embedment details.

WOOD POSTS - Use square sawed pressure treated wood as per CMS 710.14 and fabricate with square ends. Bore bolt holes and trim the tops of posts, if required, after the posts are set.

STEEL POSTS - are allowed as an alternate. Use W8x24 [W200x35.9] for 10"x10" [250x250] wood posts and use W6x25 [W150x37.1] for 8"x8" [200x200] posts. Use same post material throughout assembly.

BLOCKOUTS: Use wood blockouts only, steel or plastic blockouts are not permitted. Use notched blockouts with steel posts.

CURB: Provide a Type 4A or 4C concrete curb minimum of 20' [6 m], or longer as shown on plans, including a 10' [3 m] taper (from curb height to flush). Front of curb to be flush with face of guardrail.

FLARED GUARDRAIL: Begin Standard Guardrail Flares as shown on **SCD GR-5.1** preferably at or beyond Post No. 7; however, the flare may begin at Post No. 5.

PAYMENT: **Item 606 - Bridge Terminal Assembly, Type 1, Each,** includes the cost of extra components, in excess of normal guardrail, for additional and different size of posts and blockouts, nested Thrie-Beam, transition and connector sections, Bearing Plate, bolts, washers, nuts, and other hardware.

The curb is required in this design, and is paid separately under **Item 609 - Curb, Type 4A (or 4C), per Foot,** for the curb and taper sections, including materials, forming and labor needed to construct as shown.

THIS DRAWING REPLACES GR-3.1 DATED 1-19-07.

STATE OF OHIO DEPARTMENT OF TRANSPORTATION
10-16-09
DATE
ADMINISTRATOR

STDS. ENGINEER: M. Bline

ALL METRIC DIMENSIONS ( ) IN BRACKETS [ ] ARE IN MILLIMETERS UNLESS OTHERWISE NOTED.

OFFICE OF ROADWAY ENGINEERING

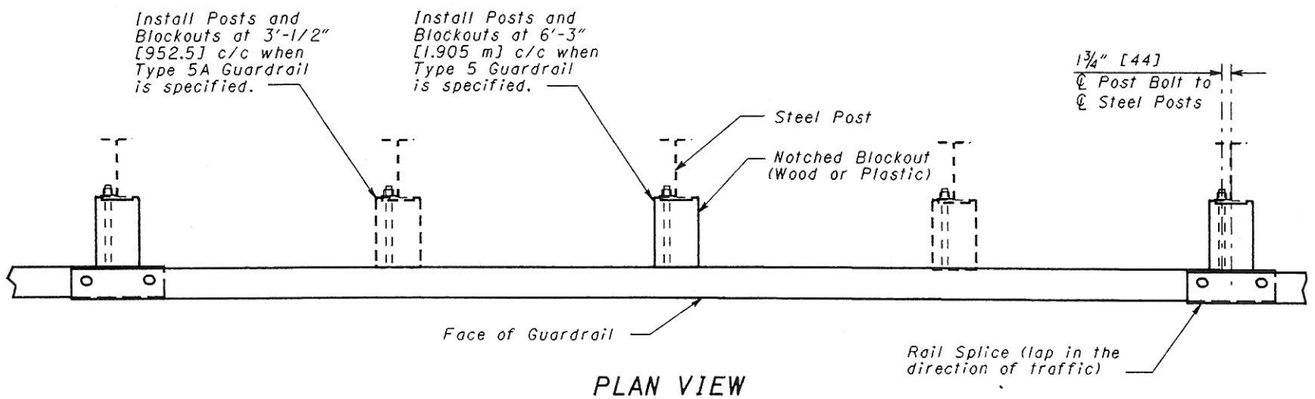
STANDARD ROADWAY CONSTRUCTION DRAWING

BRIDGE TERMINAL ASSEMBLY, TYPE 1

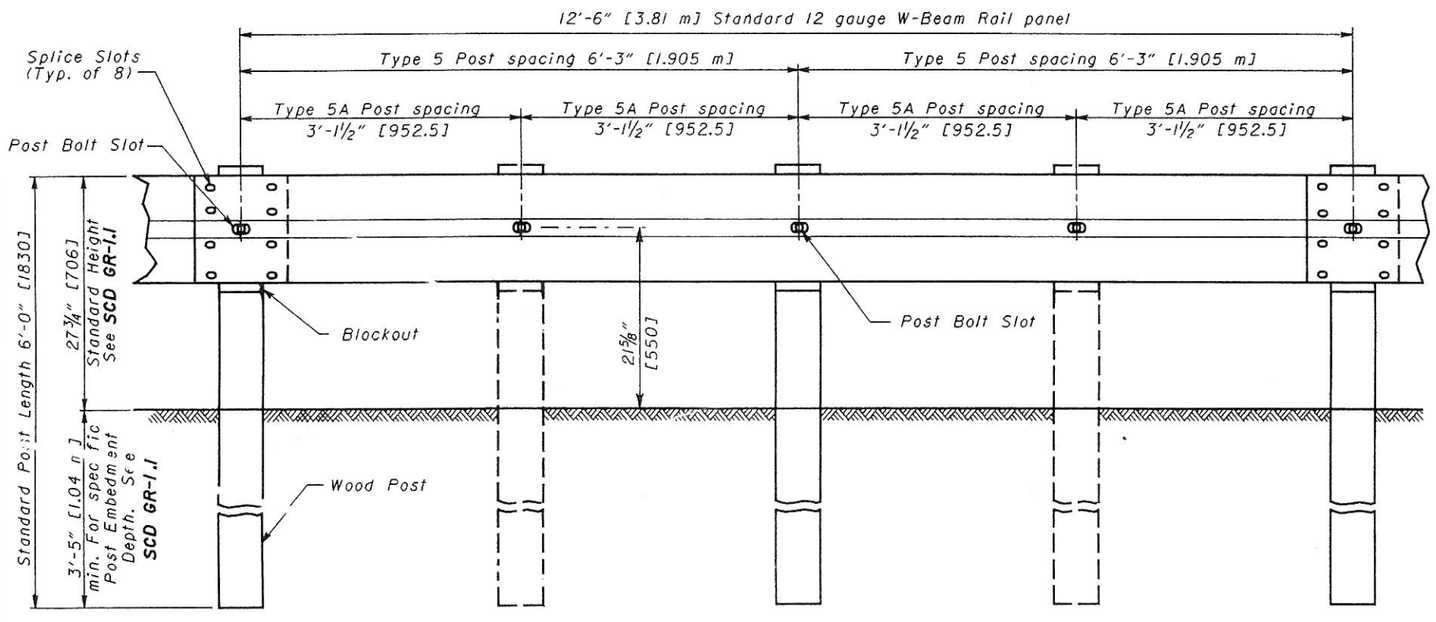
SCD NUMBER GR-3.1

1 / 1

33 / 38



PLAN VIEW
(Steel Posts shown)



ELEVATION
(Wood Posts shown)

NOTES

RAIL: Use W-Beam rail meeting AASHTO M 180 Type II Class A, as specified in CMS 606.

POSTS: Posts may be constructed of wood or steel. Wood posts may be round or 6"x8" [150x200] square-sawed.

Use round wood posts on runs of single-sided rail. The round posts shall be 8"±1 [200±25] in diameter at the top and not more than 3" [75] larger at the butt with a uniform taper.

Fabricate wood posts with square ends. Posts shall be pressure-treated as per CMS 710.14. Bore bolt holes and, if required, trim the tops of posts after the posts are set.

Steel posts are to be W6x9 [W150X13.5] or W6x8.5 [W150x12.8] galvanized steel. Use the same type of post throughout the length of the project unless otherwise specified in the plans or permitted by the Engineer.

All posts are 6'-0" [1830] long unless specified otherwise in the Contract Document. Posts may be set in drilled holes or may be driven to grade.

WELDED BEAM POSTS: Welded beam guardrail posts may be used for Item 606, Guardrail, provided the web and flange sizes are as shown here. Welding of the web to the flanges must comply with ASTM A 769, Class I, using Grade 36 steel [250 MPa yield point] with the following exceptions:

- Sec. 7.2 Test reports of tensile properties for each lot shall accompany each shipment.
- Sec. 12 Beams that have imperfections repaired by welding shall not be accepted for use in Item 606.
- Sec. 13 Random samples shall be tested by the Department from materials delivered to the project site or other locations designated by the Laboratory.

ALTERNATE POSTS: Engineered guardrail posts having met NCHRP 350 criteria, and listed on the **Office of Materials Management's** Approved List are permitted as an equal alternate when installed according to the Manufacturer's instructions and within the limitations shown on the Approved List.

BLOCKOUTS: Blockout dimensions are dependent on post used. Wood Blockouts are to be pressure treated as specified in CMS 710.14. Bore bolt holes. Approved alternate blockouts may be used in lieu of the wood blockouts shown. The approved list is maintained by the **Office of Materials Management.**

WASHERS: Install appropriate sized standard galvanized steel washers on the nut side of bolts installed on wood posts.

DELINEATION: For barrier reflectors, see CMS 626.

MISCELLANEOUS: For other guardrail details, see **SCD GR-1.1.**

STEEL BEAM POSTS (English)				
Size	**Beam depth**	**Flange width**	**Flange thickness**	**Web thickness**
Rolled W6x8.5	5.8"	3.94"	0.193"	0.170"
Rolled W6x9	5.9"	3.94"	0.215"	0.170"
Welded 6x8.5	6.0"	3.94"	0.193"	0.170"
Welded 6x9	6.0"	3.94"	0.215"	0.170"

STEEL BEAM POSTS (Metric)				
Size	**Beam depth**	**Flange width**	**Flange thickness**	**Web thickness**
Rolled W150x12.6	148 mm	100 mm	4.9 mm	4.3 mm
Rolled W150x13.5	150 mm	100 mm	5.5 mm	4.3 mm
Welded 150x12.6	152 mm	100 mm	4.9 mm	4.3 mm
Welded 150x13.5	152 mm	100 mm	5.5 mm	4.3 mm

THIS DRAWING REPLACES GR-2.1 DATED 4-18-03.

OHIO DEPARTMENT OF TRANSPORTATION — 1-16-04 DATE
ROADWAY DESIGN ENGINEER

STDS. ENGR. D. Focke

All metric dimensions are bracketed [ ] and are in millimeters unless otherwise noted.

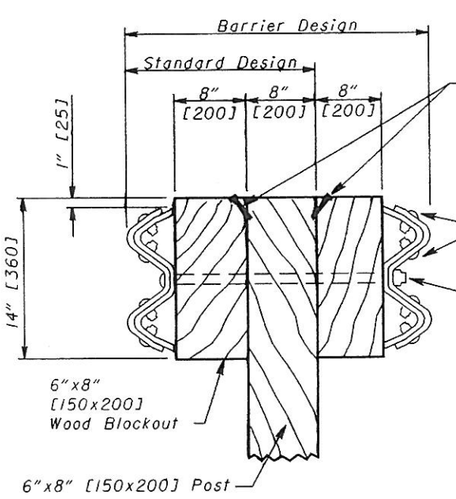
ROADWAY ENGINEERING SERVICES

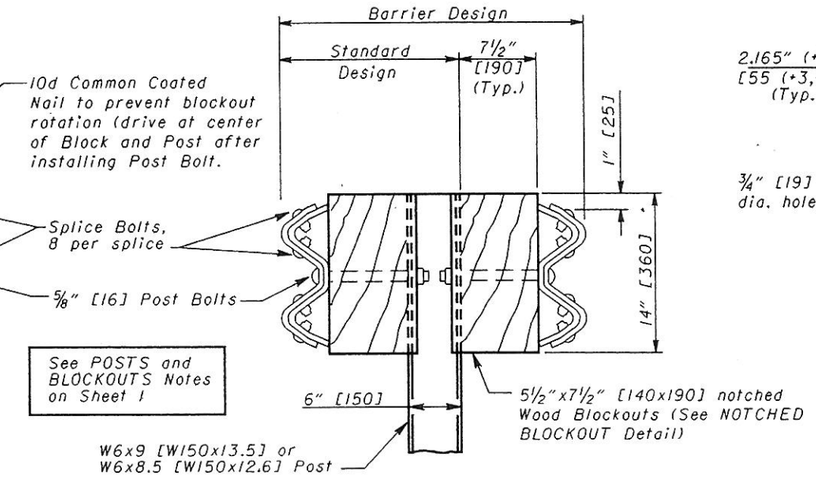
STANDARD ROADWAY CONSTRUCTION DRAWING

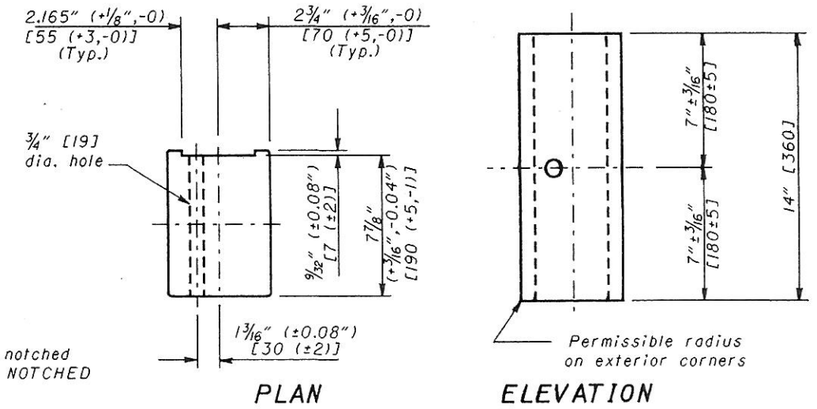
GUARDRAIL TYPE 5 & 5A

NUMBER GR-2.1

1 / 2







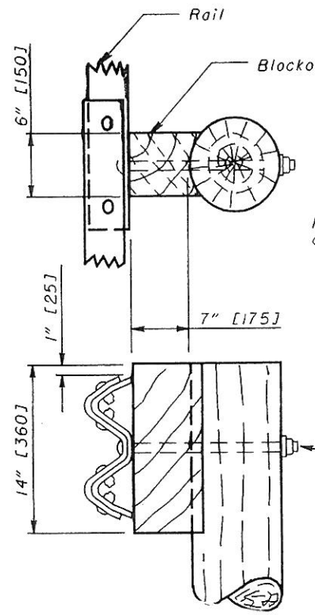
SQUARE WOOD POST

STEEL POST

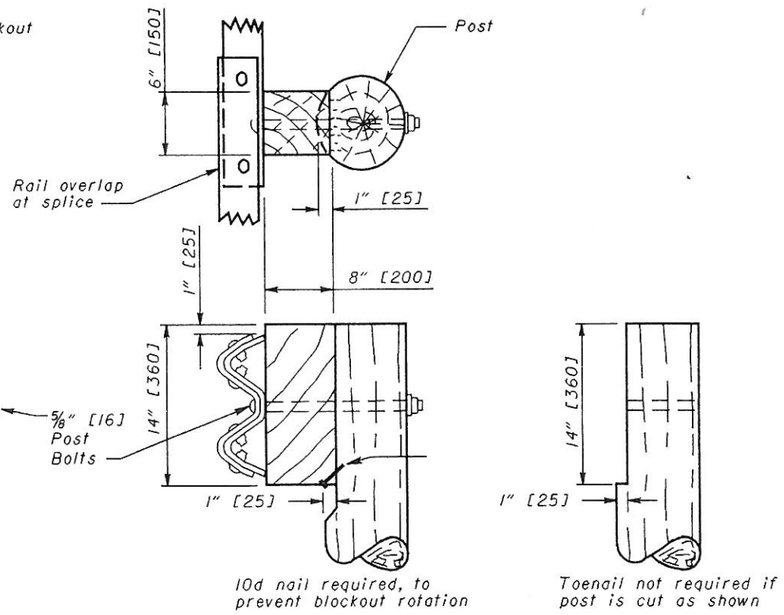
See POSTS Note, Sheet 1

NOTCHED BLOCKOUTS FOR STEEL POSTS

See BLOCKOUTS Note on Sheet 1



METHOD 1
Routed Blockout

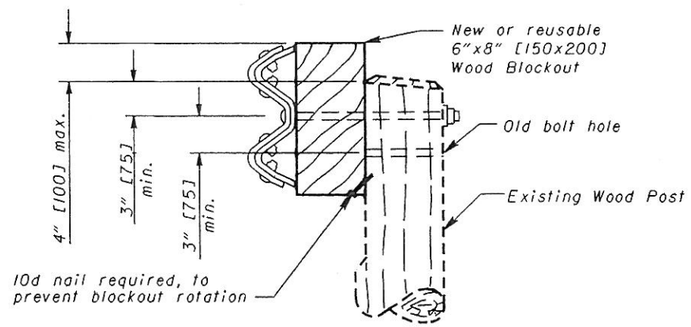


METHOD 2
Notched Post

Alternate methods of placing the Blockouts on round Posts may be submitted for consideration and approved by the Engineer.

ROUND WOOD POSTS

Single Sided runs only (Standard Design)



WOOD POSTS WITH WOOD BLOCK RAISING EXISTING GUARDRAIL HEIGHT

THIS DRAWING REPLACES GR-2.1 DATED 4-18-03.

OHIO DEPARTMENT OF TRANSPORTATION — 1-16-04 DATE
ROADWAY DESIGN ENGINEER
STDS. ENGR. D. Focke
All metric dimensions (in brackets [ ]) are in millimeters unless otherwise noted.

ROADWAY ENGINEERING SERVICES

STANDARD ROADWAY CONSTRUCTION DRAWING
GUARDRAIL TYPE 5 & 5A

NUMBER GR-2.1

2 / 2

NOTES

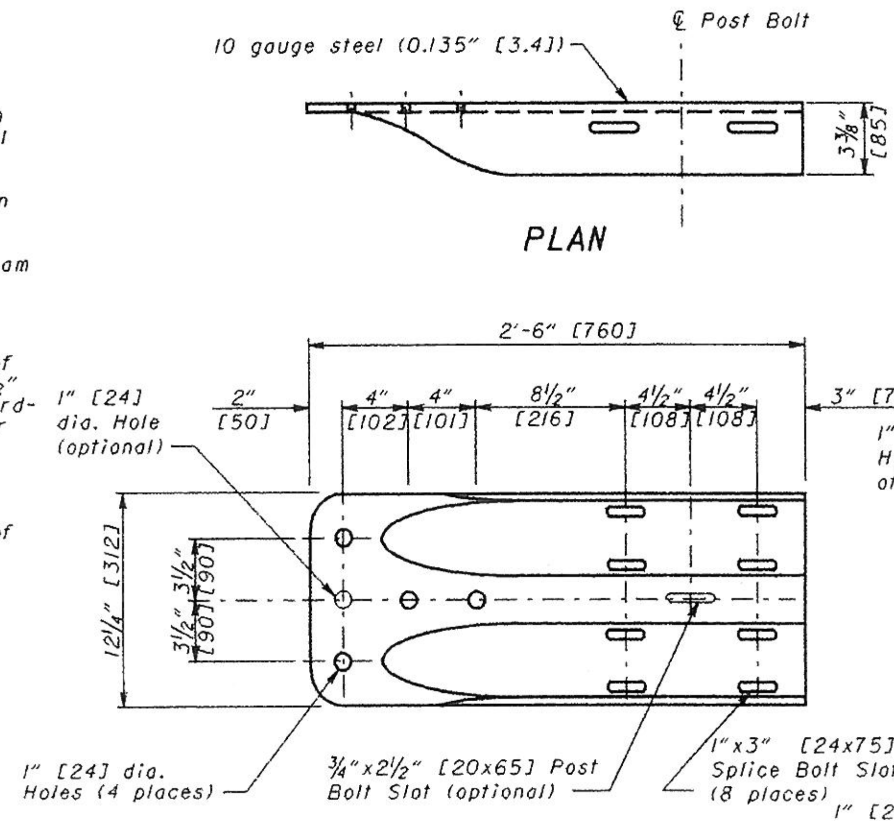
GENERAL: Components shown on this drawing are used in a variety of guardrail systems. See individual guardrail drawing for specific applications.

See CMS 606 for guardrail specifications not covered on these drawings.

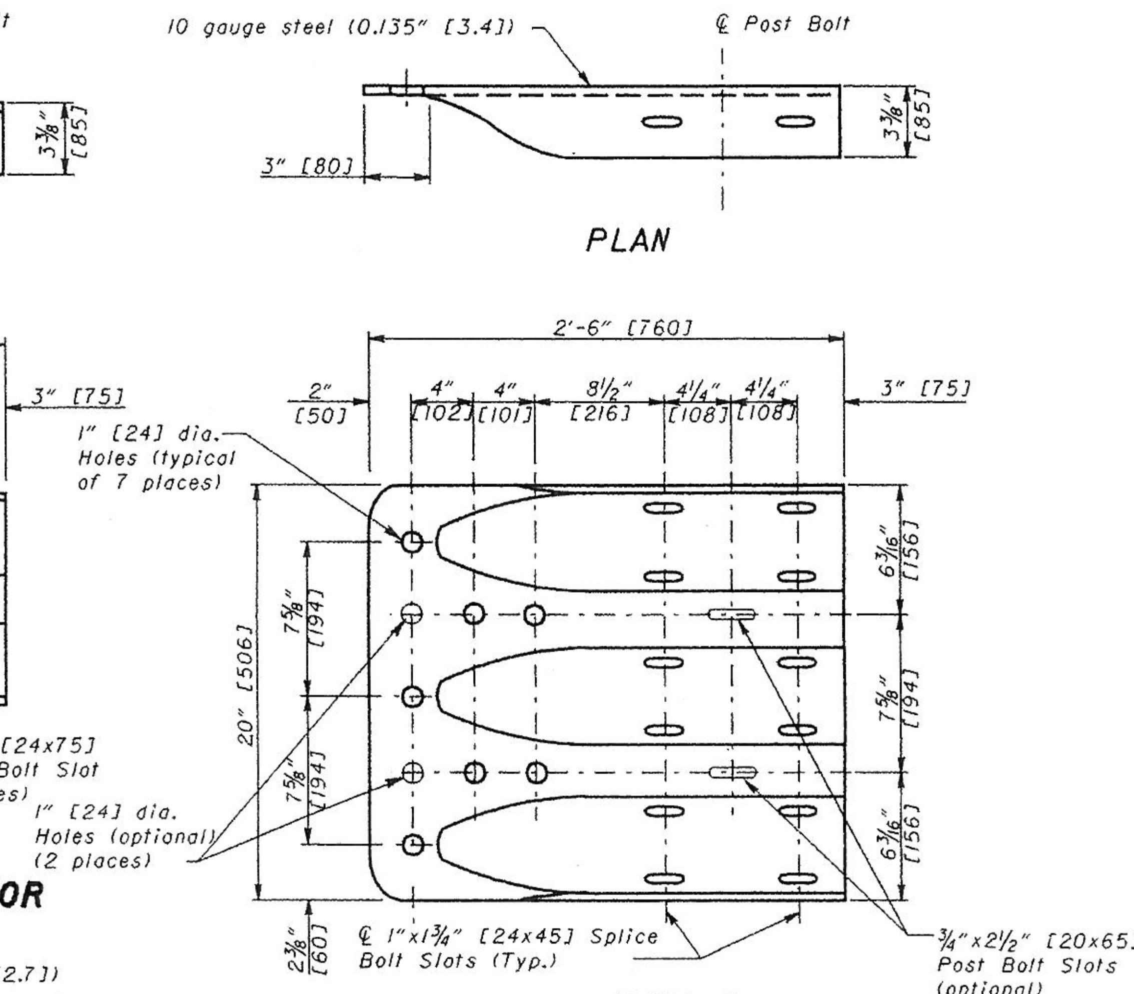
Refer to AASHTO M 180 for dimensional details of W-Beam and Thrie-Beam rail elements, related buffer and end sections, beam splices, post and splice bolts, nuts, and Type I W-Beam to Thrie-Beam Transition sections.

RAIL ELEMENTS: W-Beam Rail has an effective length of 12'-6" [3.81 m], unless otherwise specified, with ¾"x2½" [19x64] post bolt slots on 6'-3" [1.905 m] centers regardless of post spacing. Field punch or drill bolt holes or slots for irregularly spaced posts as specified in CMS 606.04.

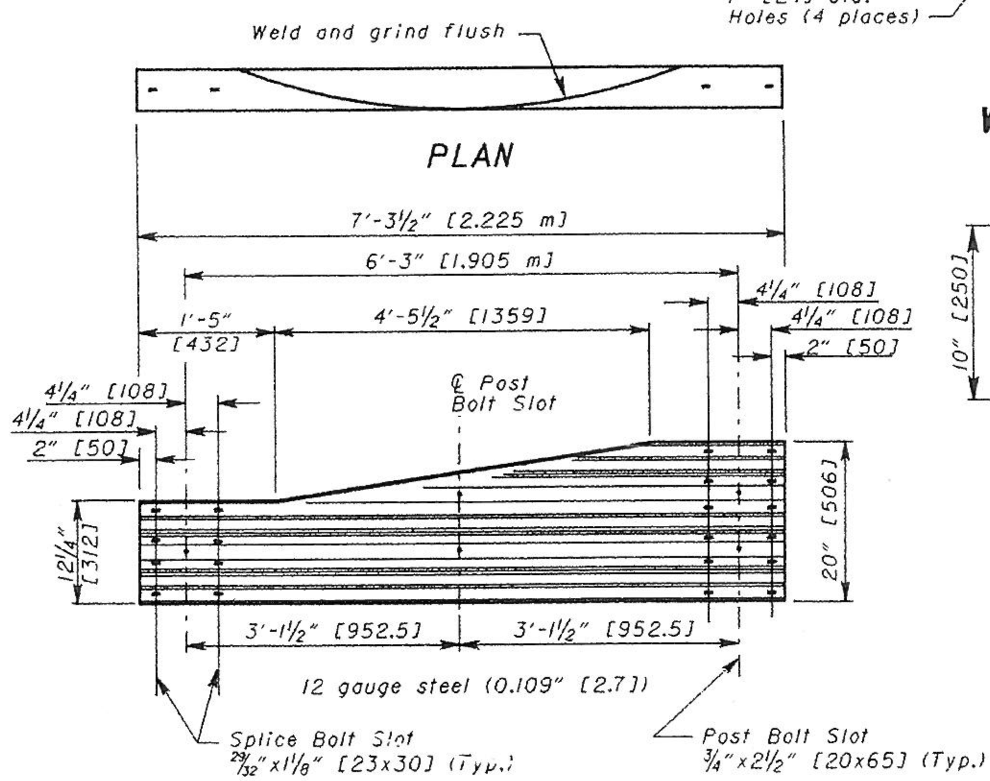
RAIL SPLICE: Lap splices between two rail elements or between a rail and terminal connector in the direction of traffic. Lap the buffer or flared end sections in the direction of traffic.



ELEVATION
W-BEAM TERMINAL CONNECTOR

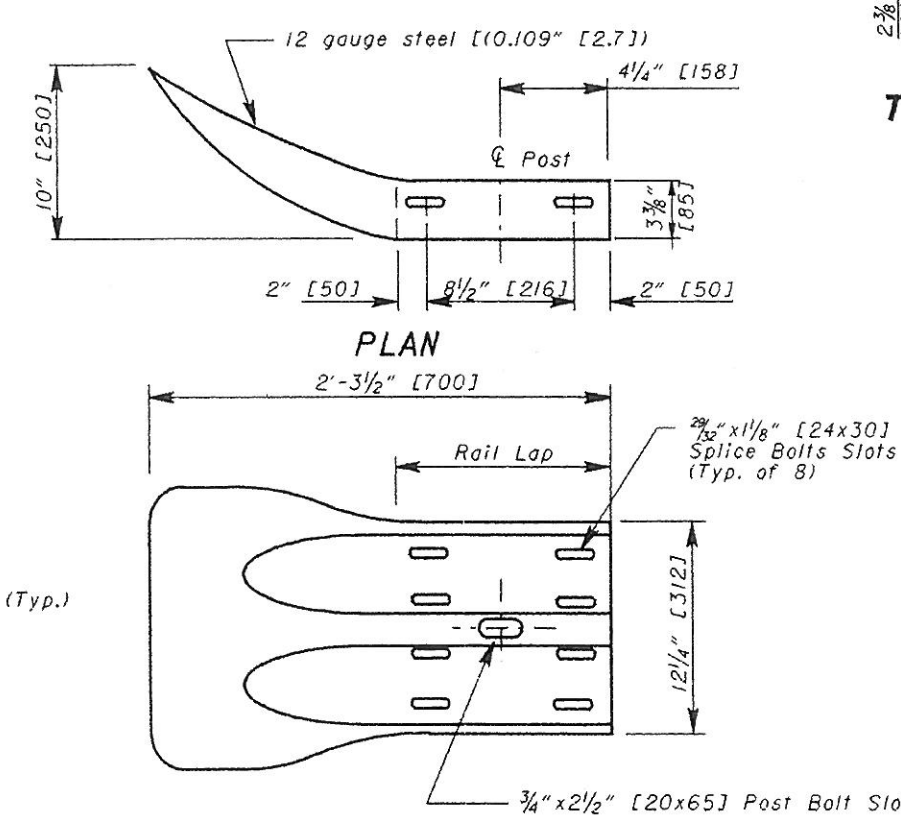


ELEVATION
THRIE-BEAM TERMINAL CONNECTOR

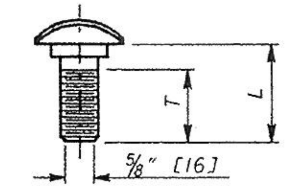


ELEVATION
TYPE 2 TRANSITION SECTION
(Asymmetric W to Thrie-Beam)

For details of Type I Transition Section (Symmetric), refer to AASHTO M 180, Figure 4.



ELEVATION
W-BEAM FLARED END SECTION



GUARDRAIL BOLT (For Post and Splice Bolts)		
L	**T min.**	**Bolt Use**
18" [460] (Standard Rail)	4" [100]	Type 5: WP/WB, PB
26" [640] (Barrier Rail)		
10" [255]	4" [100]	Type 5: SP/WB, PB
1¼" [35]	1⅛" [30]	Splice Bolt
WP- Wood Post WB- Wood Blockout SP- Steel Post PB- Plastic Blockout Longer Bolt may be needed for round Wood Post larger than 8" [200] dia.		

THIS DRAWING REPLACES GR-1.1 DATED 4-18-03.

OHIO DEPARTMENT OF TRANSPORTATION
ROADWAY DESIGN ENGINEER
7-16-04
DATE

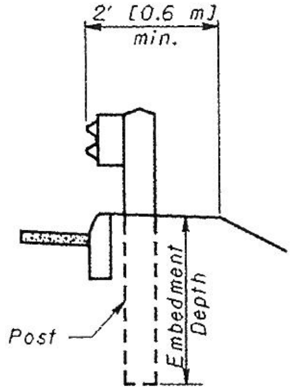
STDS. ENGR. D. Focke

All metric dimensions (in brackets [ ]) are in millimeters unless otherwise noted.

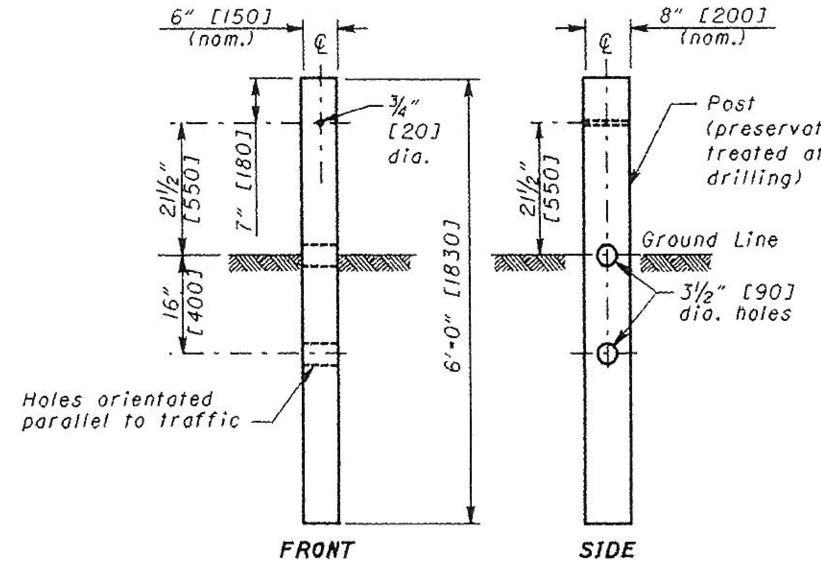
ROADWAY ENGINEERING SERVICES

STANDARD ROADWAY CONSTRUCTION DRAWING
GUARDRAIL DETAILS (Rail Components)

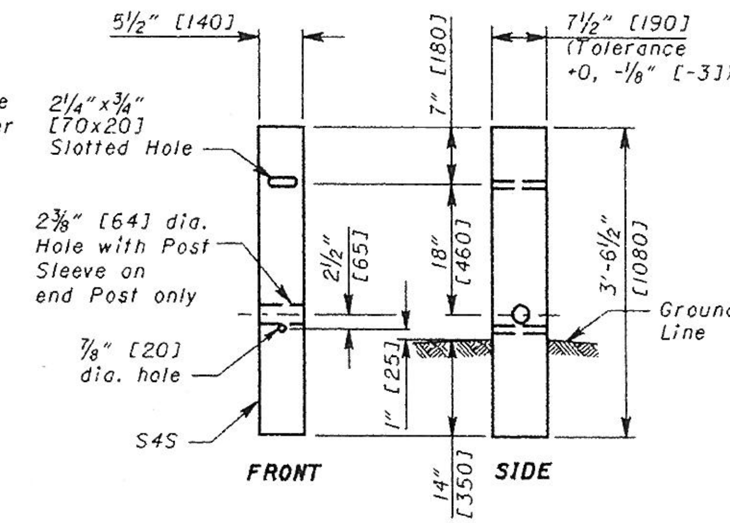
NUMBER **GR-1.1**



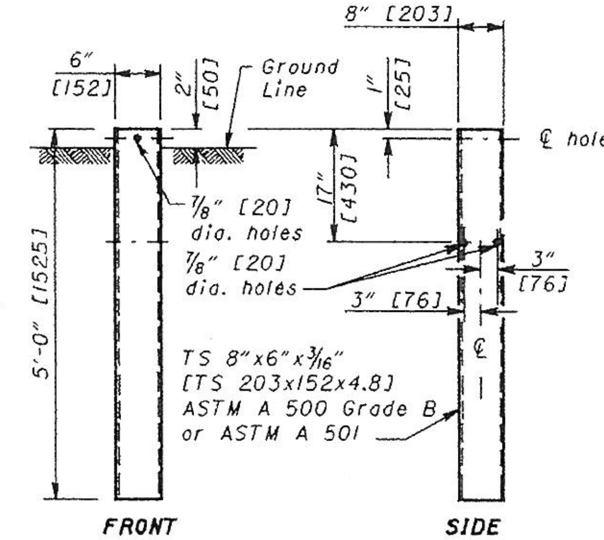
DETAIL A
See POST EMBEDMENT DEPTH Note



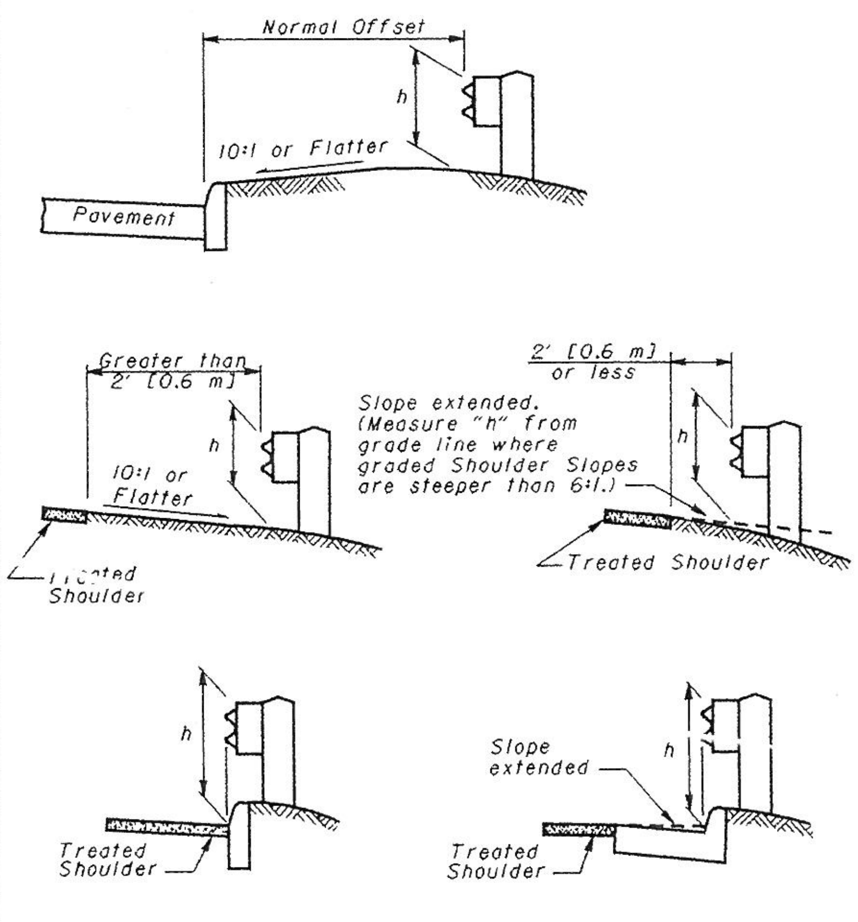
TYPE 1 BREAKAWAY CRT POST



TYPE 2 BREAKAWAY CRT POST



STEEL GROUND TUBE



h - Standard Height (See GUARDRAIL HEIGHT Note)

MEASURING GUARDRAIL HEIGHT

NOTES

GUARDRAIL HEIGHT: For initial installation, construct the guardrail within ± 1" [25] of the standard height, h, or 27¾" [706] to the top of W-Beam rail. (See MEASURING GUARDRAIL HEIGHT Detail.) When subsequent projects, such as resurfacings, affect the height of existing guardrail, the finished height is to be within ±3" [75] of the standard height.

POST EMBEDMENT DEPTH: Where less than 2' [0.6 m] of graded shoulder shoulder width (10:1 or flatter) exists, measured from from the face of the guardrail (see DETAIL "A"), use longer posts so that a minimum of 5'-5" [1.65 m] embedment depth is provided. Payment for the longer posts will be made at the unit price bid for **Item 606 - Guardrail Post, 9' [2.75 m], Each.**

SPECIAL POST MOUNTINGS: Install posts located over a drainage inlet or structure as shown in the FOOTING ANCHOR Detail, or anchor per the details shown on **SCD GR-2.2.**

Install posts located over a footing with a cover of less than 2'-6" [0.75 m] with a footing anchor as detailed here. (A plate, as detailed on SECTION B-B of **SCD GR-2.2,** may be used as an alternative attachment method.) Where the cover is between 2'-6" [0.75 m] and 3'-5" [1.04 m], the footing anchor may be omitted and the post encased instead with 4" [100] (min.) of concrete.

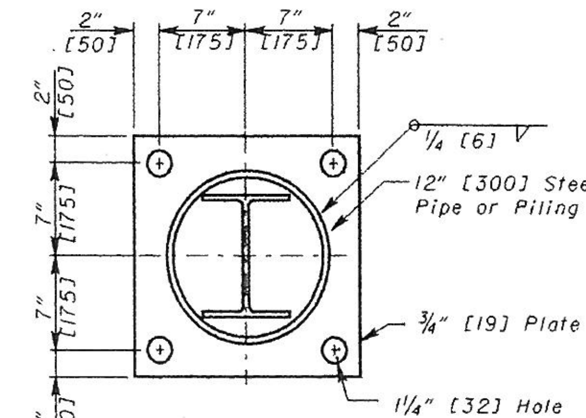
Do not drive posts located over a culvert with less than 4'-3" [1.3 m] of cover; instead set in drilled or dug holes. Where the available post embedment depth is less than 3'-5" [1.04 m], encase the post with a minimum of 4" [100] concrete.

All costs associated with special post mountings are included in the unit price bid for Item 606 Guardrail of the type specified in the plans.

ANCHORS: Holes and grouting shall comply with CMS 510. Use either cement or nonshrink, nonmetallic grout.

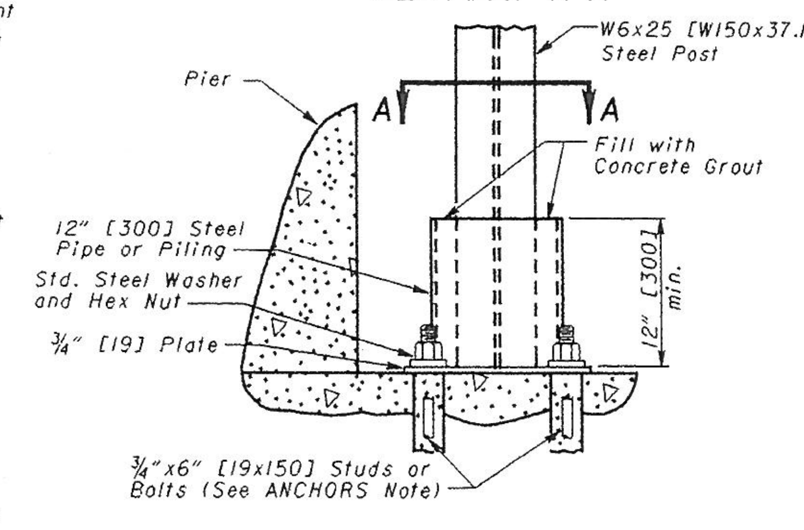
Expansion shield anchors as specified in CMS 712.01 may be substituted except where concrete deterioration has occurred, as determined by the Engineer. Where self-drilling anchors are used, drill the holes with the expansion shield (not by a drill bit) and install the shield flush with the concrete surface.

PROTECTIVE COATING: In lieu of the complying with CMS 710.06, coat expansion shields, anchors and concrete insert anchor assemblies embedded in concrete in accordance with ASTM A 153 or be of stainless steel. Any bolts screwed into these devices shall meet CMS 710.06. (See sheet 3 for Concrete Insert Anchor Assembly Detail.)



Footing Anchor and hardware need not be galvanized

SECTION A-A



ELEVATION
FOOTING ANCHOR
See SPECIAL POST MOUNTINGS Note.

THIS DRAWING REPLACES GR-1.1 DATED 4-18-03.

OHIO DEPARTMENT OF TRANSPORTATION
ROADWAY DESIGN ENGINEER
7-16-04
DATE

STDS. ENGR. D. Focke

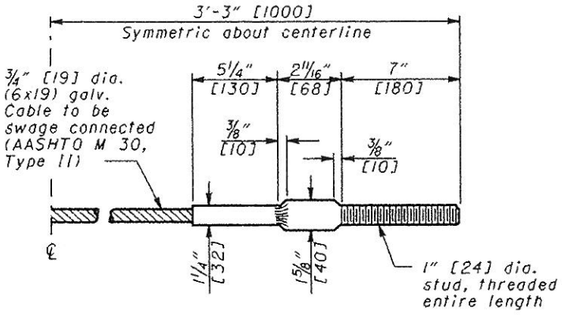
All metric dimensions (in brackets [ ]) are in millimeters unless otherwise noted.

ROADWAY ENGINEERING SERVICES

STANDARD ROADWAY CONSTRUCTION DRAWING
GUARDRAIL DETAILS (Posts)

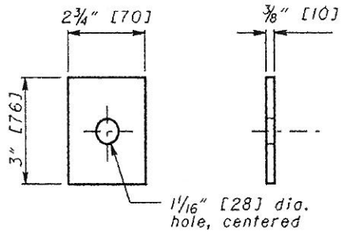
NUMBER GR-1.1

2/3

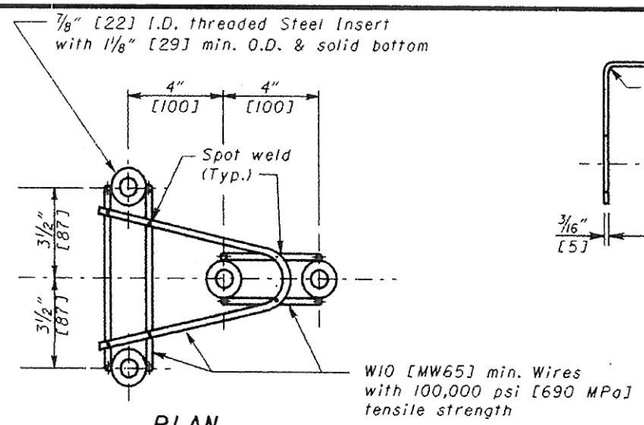


STANDARD SWAGED FITTING AND STUD

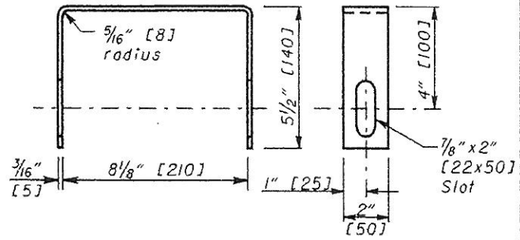
CABLE ANCHOR



END PLATE

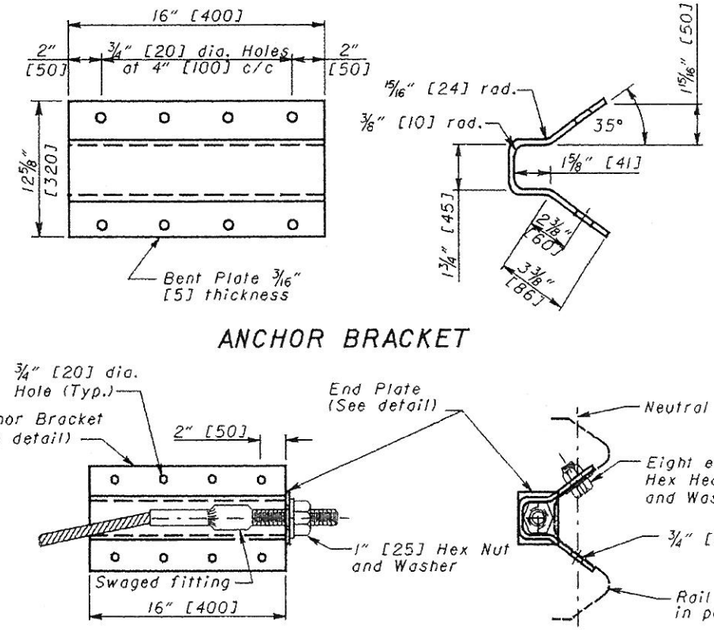


PLAN

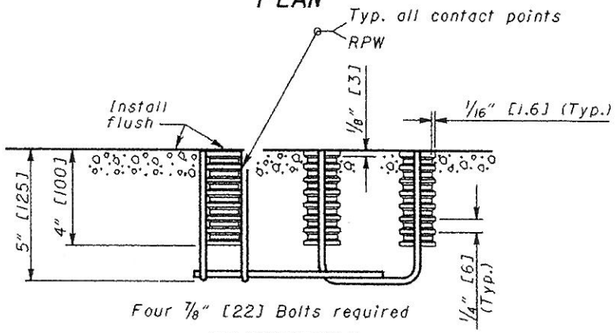


YOKE

Two required in Assembly

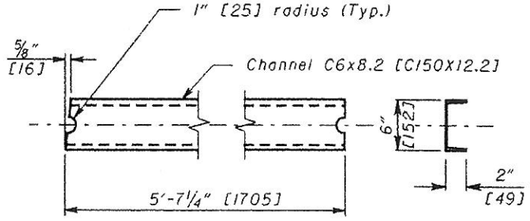


ANCHOR BRACKET



Four 7/8" [22] Bolts required

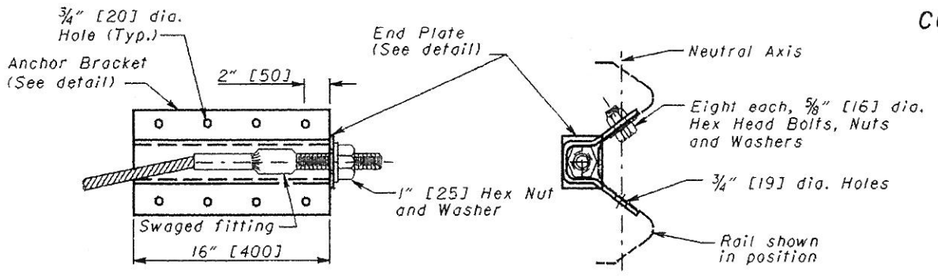
ELEVATION



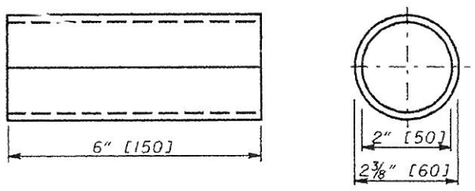
STRUT

CONCRETE INSERT ANCHOR ASSEMBLY (W-BEAM ONLY)

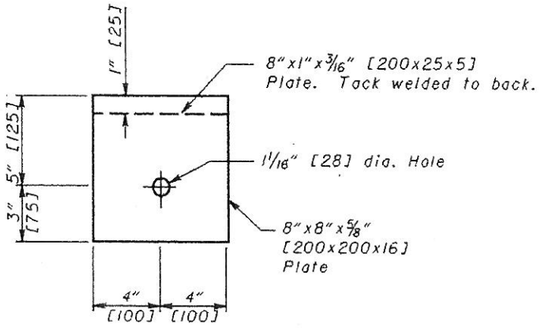
See ANCHORS and PROTECTIVE COATINGS Notes on Sheet 2



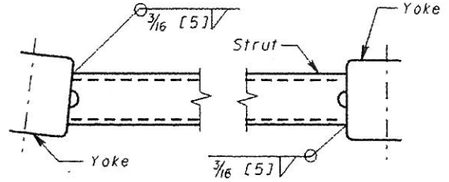
ANCHOR BRACKET ASSEMBLY DETAILS



POST SLEEVE

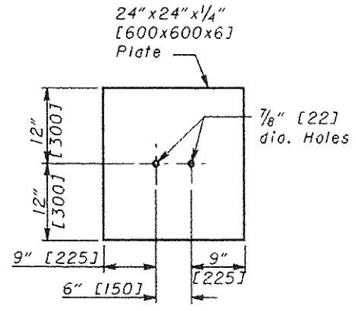


BEARING PLATE



Channel legs shown down. For opposite hand, install Channel legs up.

STRUT AND YOKE ASSEMBLY



SOIL PLATE

THIS DRAWING REPLACES GR-1.1 DATED 4-18-03.

DEPARTMENT OF TRANSPORTATION	7-16-04 DATE
ROADWAY DESIGN ENGINEER	Paul T. Gatchell
STDS. ENGR.	D. Focke
All metric dimensions (in brackets [ ]) are in millimeters unless otherwise noted.	
ROADWAY ENGINEERING SERVICES	
STANDARD ROADWAY CONSTRUCTION DRAWING	GUARDRAIL DETAILS (Misc. Components)
NUMBER	GR-1.1
	3 / 3